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Geriatrics

VOLUME 8 • NUMBER 10 October 1953

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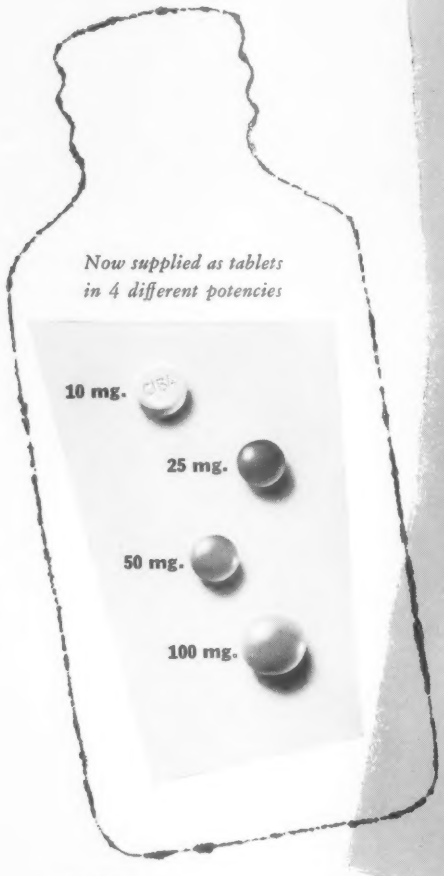

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GERIATRICS

October, 1953
Volume 8
Number 10

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GERIATRICS is published monthly at 84 South Tenth Street, Minneapolis 3, Minnesota by Lancet Publications, Incorporated. Subscription rates: $8.00 a year, 75c a copy; foreign, $9.00 a year, 85c a copy. Entered as second class matter February 14, 1946, at the post office at Minneapolis, Minnesota, under the act of March 3, 1879.

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1. Rothman, J. and Shapiro, A. L.: Med. Clin. N. Amer. 33:274-5, Jan., 1949.
2. Stieglitz, E. J.: Geriatric Medicine, p. 848, 1943.

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Looking forward

Papers and authors you will meet in the November issue . . .

Treatment of coronary artery insufficiency by **The Formation of a Third Coronary Artery by Internal Mammary Artery Implantation** is discussed by Dr. Arthur Vineberg, lecturer in surgery at McGill University and chief surgeon at Grace Dart Home Hospital, Montreal. His studies show that the implant is capable of sustaining life and preventing infarction when a major coronary vessel, the anterior descending branch, is occluded. The implant also is capable of revascularizing the myocardium in a high percentage of cases. Of 9 patients subjected to internal mammary artery implantation, 6 are living and, of these, 5 are well.

•

Oral colchicine is the drug of choice for **The Treatment of Gout,** according to Dr. John H. Talbott, professor of medicine, and Dr. L. Maxwell Lockie, professor of therapeutics at the University of Buffalo School of Medicine. They stress a high fluid intake, avoidance of a high fat diet, and rest of the affected joints. Daily doses of Benemid in addition to colchicine are advised. If treated properly, few patients with gout become arthritic cripples, and prognosis is usually favorable.

•

A method of classifying patients with hypertensive cardiovascular disease and various **Surgical Measures in Hypertension** are discussed by Dr. Jesse E. Thompson, assisting visiting surgeon at Massachusetts Memorial Hospitals and instructor in surgery at Boston University School of Medicine, and Dr. Reginald H. Smithwick, surgeon-in-chief at Massachusetts Memorial Hospitals and professor and chairman of the department of surgery at Boston University School of Medicine. They find the most useful surgical procedure to be thoracolumbar splanchnicectomy. Patients with persistent nitrogen retention are not considered suitable for surgical therapy.

•

In a roentgenographic study of 130 patients, **Flat Heads Among the Aged Due to Thin Parietal Bones** were encountered in 3.3 per cent. Dr. J. Gershon-Cohen, director of radiology, Dr. Harald Schraer, of the x-ray department, and Dr. Nathan Blumberg, consultant in medicine at the Albert Einstein Medical Center, Philadelphia, believe that since the condition is found at all ages, it represents a congenital variation of development which becomes more prominent with aging atrophy. Parietal thinness also is of clinical significance when it must be differentiated from possible malignant areas, inflammation, or trauma.

•

For these and other articles, abstracts, reviews and special features, read every issue of Geriatrics.

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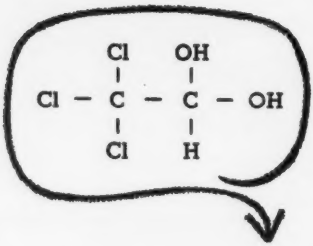

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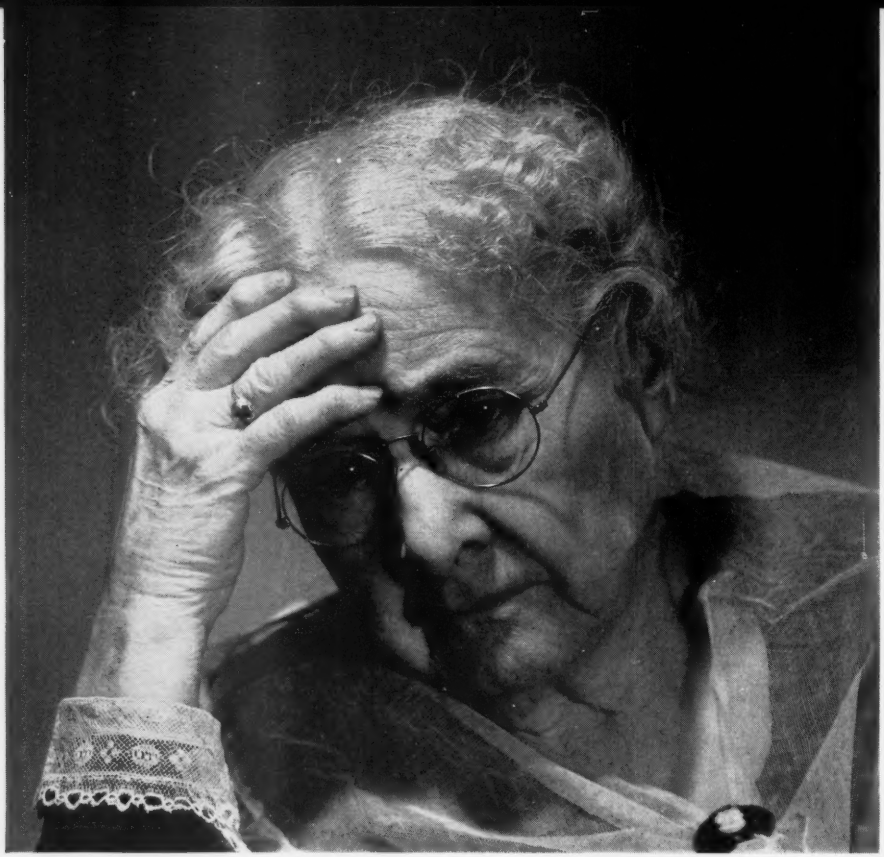

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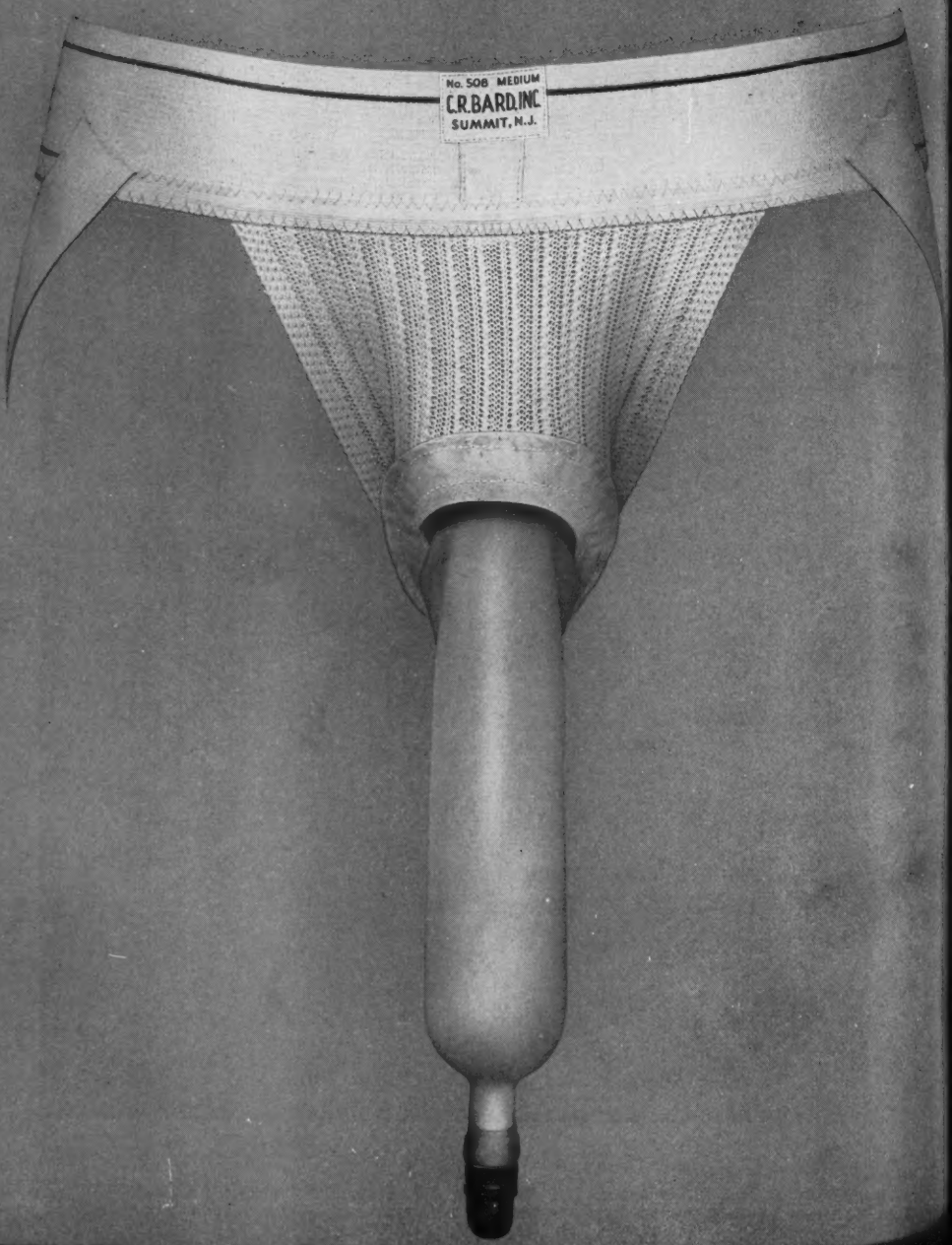

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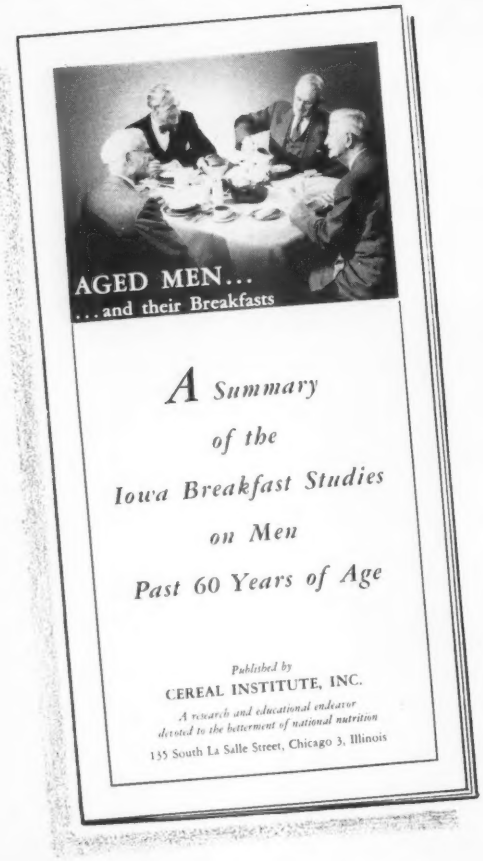
A Report to Physicians of a Two-Year Nutrition Study Involving Men Past 60 Years of Age



During 1950 and 1951 carefully controlled studies were made on men past 60 years of age to see if the same principles regarding breakfast habits held for this fast growing segment of the population as those found for young men and young women. These experiments were conducted jointly by the Departments of Physiology and Nutrition at the State University of Iowa.

In order to appraise the effects of various breakfast habits on the physiologic response of the older aged group, specially designed equipment was employed for measuring choice reaction time, neuromuscular tremor magnitude, maximum grip strength and grip strength endurance, and oxygen required to perform work. Also, blood sugar determination and balance studies involving the vitamins, thiamine, and niacin, and the minerals calcium, phosphorus and iron, were made. In addition, nitrogen retention studies following various types of breakfast regimens were done. The conclusions drawn from these studies are outlined on the following page.

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The experiments involving men past 60 years of age demonstrated sound and important nutritional principles:

1. Breakfast was essential for nervous and physical efficiency during the morning hours.

2. The omission of breakfast resulted in detrimental effects which may be reflected in decreased strength and strength endurance, decreased capacity to do work, and increased nervous tension.

3. The basic cereal breakfast consisting of fruit, cereal, milk, bread and butter supplying one-fourth the daily protein and caloric requirements is a sound breakfast since it was adequate for maintaining certain physiologic functions at peak levels throughout the morning.

4. The basic cereal and milk breakfast was just as efficient as a bacon, egg, and milk breakfast containing the same amount of protein and calories.

5. A breakfast supplying one-fourth the daily protein and caloric needs was more conducive to physical fitness and mental alertness than a large breakfast which provides 40 per cent of the daily protein and caloric requirements.

6. The protein contained in cereals was just as effective in maintaining the blood sugar above the fasting level following breakfast as that in bacon and eggs.

7. The biochemical studies showed that from a twenty-four hour metabolic standpoint the basic cereal and milk breakfast was nutritionally as favorable as an isocaloric bacon, egg, and milk breakfast, as shown by retention studies involving B-vitamins, nitrogen, and essential minerals.

8. It was of interest to note that men past 60 years of age were eager and capable of eating a good breakfast, if they were properly motivated, and if it were made available to them.

The conclusions drawn from the study of older men not only confirmed many of the findings which applied to young men and women, but demonstrated that, for the most part, the same nutritional principles apply to the young and old alike. As was the case with the young women and young men, the body weight changes of the older men were not affected by the breakfast regimens.

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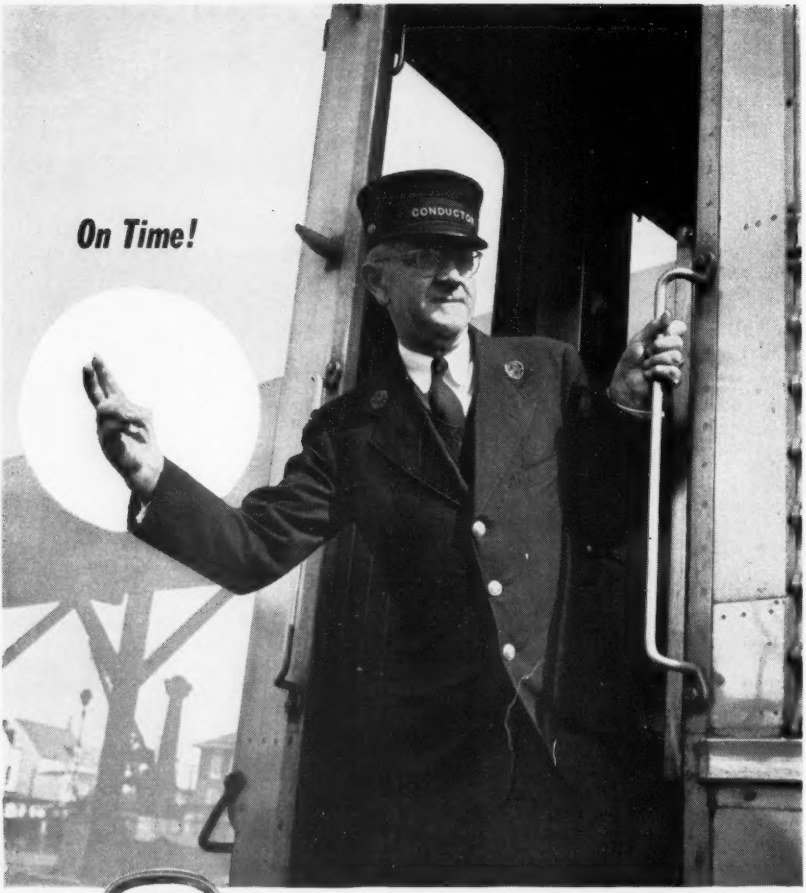

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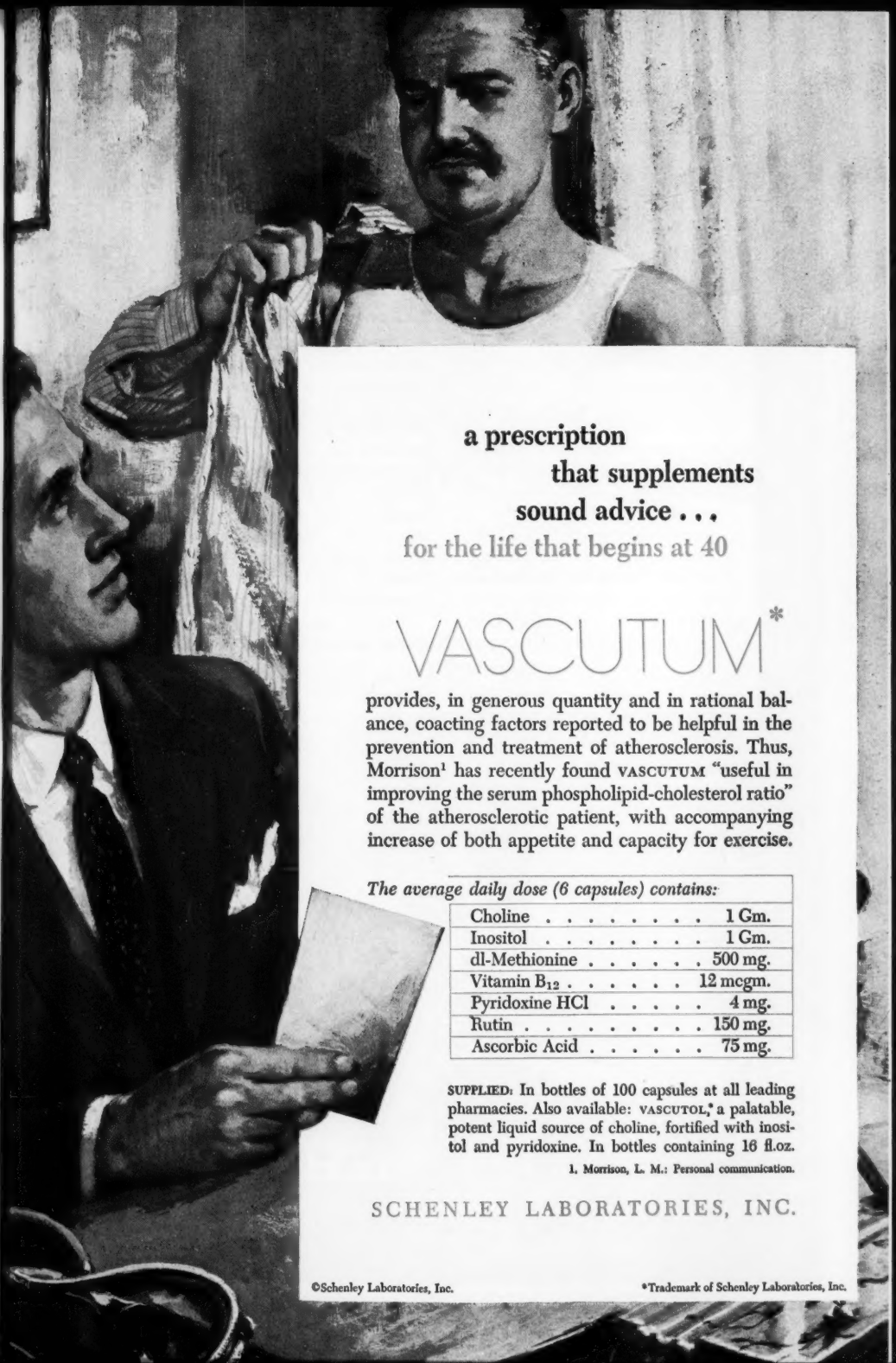

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1. Morrison, L. M.: Personal communication.

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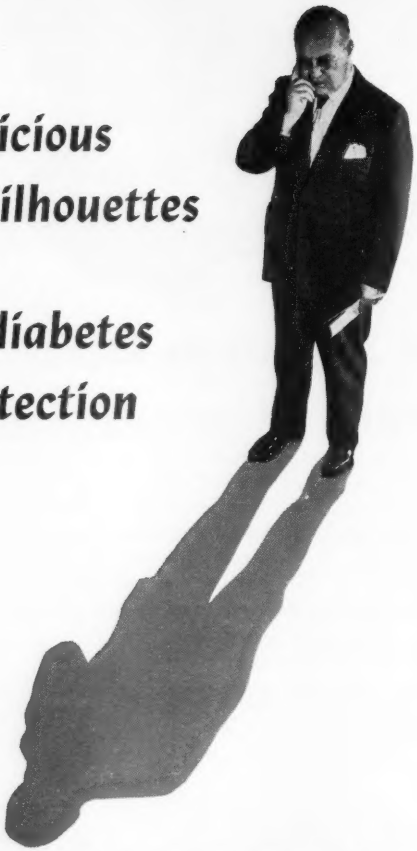

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GERIATRICS

Plastic Surgical Repair of Chronic Leg Ulcers*

Paul W. Greeley, M.D., F.A.C.S.

THE MAJORITY of the chronic ulcers of the lower extremity fail to heal because of the poor blood supply in an area whose basic circulation is comparatively deficient even under normal conditions. Any such wound that has remained open for a long period of time becomes fibrotic, which in turn interferes further with an already damaged circulation. Consequently, before any local reconstructive measures can be undertaken, study of the underlying circulation must be made and these factors corrected first.

This presentation discusses the management of chronic ulcers of the lower extremity that follow burns and avulsions, compound fractures, varicose, postphlebitic, and arteriosclerotic ulcers, radiation injuries, and carcinoma.

Before discussing the management of the foregoing individual problems, I would like to speak briefly of the different types of skin grafting procedures that may be utilized in the actual covering of these chronic open wounds.

The most useful, and at the same time the simplest, is the split-thickness skin graft, one in which approximately the outer half of the entire thickness of the skin is used (figure 1). These grafts can be cut rapidly by one of several different methods. They grow well, and the donor site from which they are taken heals spontaneously. They can be applied to any recipient area in which there is sufficient blood supply to insure growth of the transplant. This implies the presence of an adequate subcutaneous fat pad beneath the chronic ulcer bed.

PAUL W. GREELEY, *a 1928 graduate of Northwestern University Medical School, is professor of surgery and head of the division of plastic surgery at the University of Illinois College of Medicine, and attending plastic surgeon at the University of Illinois Hospitals and St. Luke's Hospital, Chicago.*

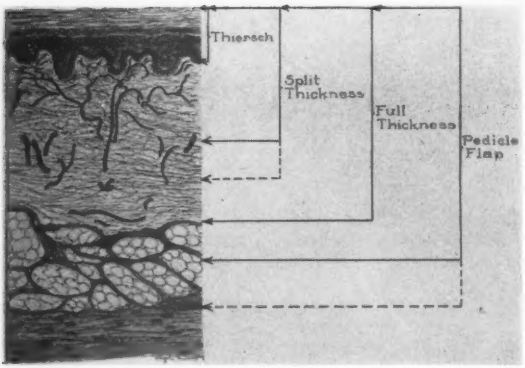

Fig. 1. Cross section of skin showing approximate thickness of different types of skin grafts.

On the other hand, many defects that follow excision of a chronic ulcer will be complicated by the absence of normal subcutaneous fat. Muscles, tendons, joints, periosteum, and even necrotic or sclerotic bone will be left exposed. This type of wound should be covered with skin and subcutaneous fat. This will necessitate the use of one of the more complicated pedicle flap operations. The choice of an open direct flap or one which has previously been tubed is not too important. But, because any flap operation is complicated in all respects, its indications for use must be considered carefully.

*From the Department of Surgery, Division of Plastic Surgery, University of Illinois College of Medicine; University of Illinois Hospitals and St. Luke's Hospital, Chicago.

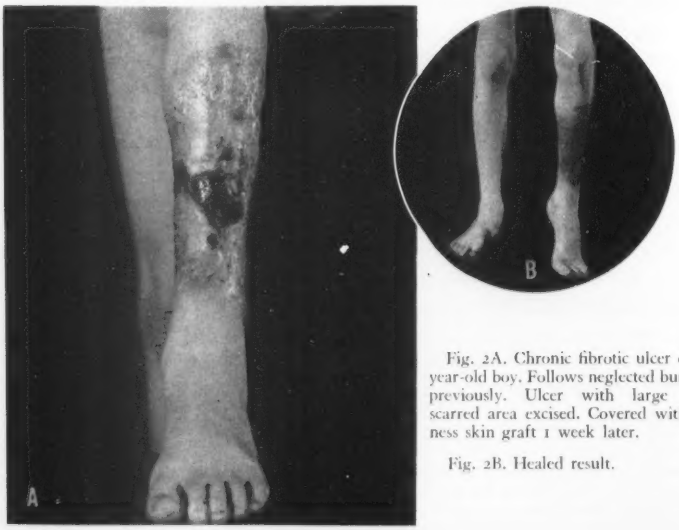

Fig. 2A. Chronic fibrotic ulcer of leg in 12-year-old boy. Follows neglected burn 10 months previously. Ulcer with large surrounding scarred area excised. Covered with split-thickness skin graft 1 week later.

Fig. 2B. Healed result.

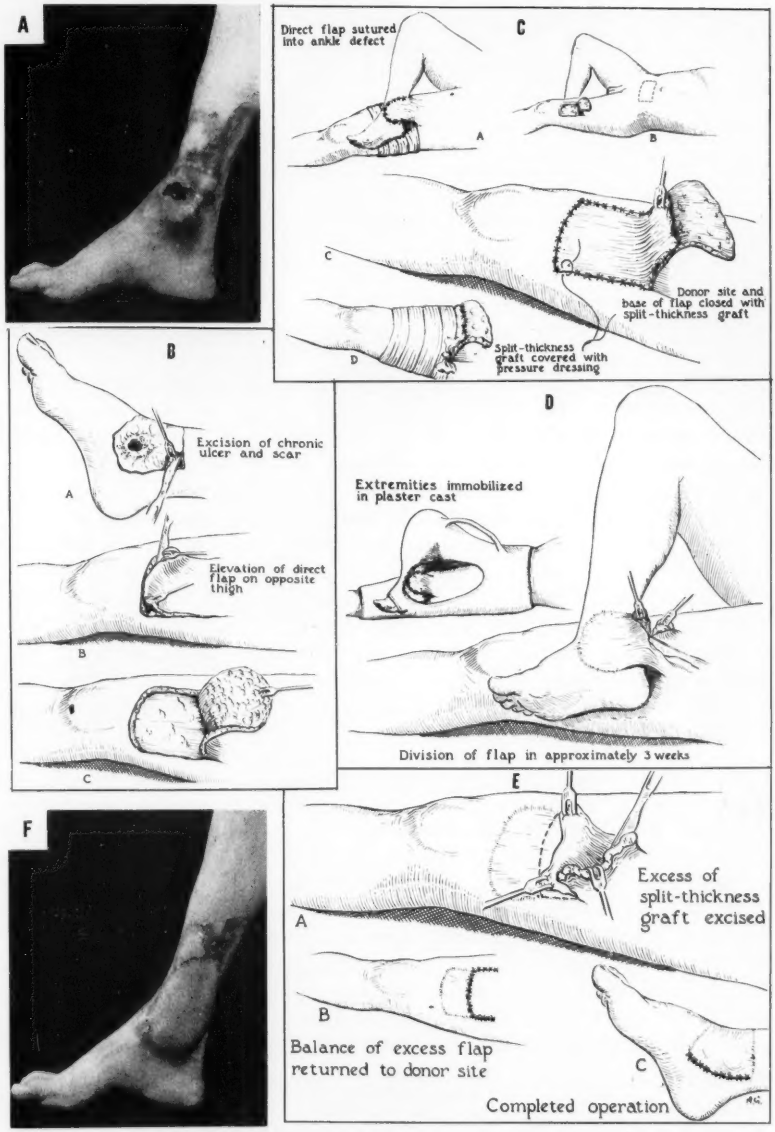

Fig. 3A. Chronic leg ulcer in 30-year-old male after compound fracture of tibia and fibula.

Fig. 3B, C, D, E. Method of coverage by direct flap from opposite thigh.

Fig. 3F. Healed result. (Reproduced courtesy *Surgical Clinics of North America*, Oct., 1949, 1551-1563.)

The use of any other type of skin graft has very little importance in the covering of chronic open wounds of the lower extremity. Pinch grafts give a poor surface covering. Full-thickness skin grafts cannot be expected to grow. Consequently the split-thickness skin graft is usually used and some type of pedicle flap, when skin with its subcutaneous fat pad is needed.

BURNS AND AVULSIONS

Chronic ulcers are frequently encountered after untreated third degree burns or traumatic loss of skin and subcutaneous fat. These wounds are superficial, are surrounded by scarring of the borders, and in the center is an area of fibrotic chronic granulation tissue. Scratching of this wound produces little or no bleeding.

Treatment consists of wide excision of all chronic granulation tissue and surrounding scar back into an area of normal tissues. Practically all of these wounds can be covered with a split-thickness skin graft since normal subcutaneous fat is usually preserved. If a dry bed can be obtained, immediate skin grafting can be carried out. If there is considerable uncontrollable capillary bleeding, the procedure should not be undertaken until the bed is dry. This may be accomplished by the temporary application of sterile dressings under moderate pressure and placing the patient on adequate antibiotic therapy. After twenty-four to forty-eight hours the patient is returned to surgery and the dressings removed under anesthesia. Invariably a dry bed is observed at this time, thus making it possible to proceed with a successful skin grafting operation. An alternative procedure is to wait seven to ten days during which time a fresh, firm granulating bed will develop. This also makes an excellent recipient site upon which an excellent growth of a skin graft can be anticipated (figure 2).

ULCERS ASSOCIATED WITH COMPOUND FRACTURES

Wounds of this type are always fibrotic, scarred, and frequently have sclerotic or necrotic bone in the base of the chronic ulcer. Treatment consists of removal of all scarring and elimination of any bony sequestra if present. If the bone is merely sclerotic, the local blood supply can sometimes be improved by making multiple drill holes into the cortex or actually chiseling off some of the cortex into the Haversian system beneath. Fresh granulations with a good blood supply usually develop within the following ten days. This defect can then be covered satisfactorily with a split-thickness skin graft. Otherwise it will be necessary to utilize a flap of skin and subcutaneous fat (figure 3).

VARICOSE ULCERS

Varicose ulcers are always superficial and do not penetrate the deep fascia. Before local treatment can be undertaken, the varicosities must first be eliminated by ligation, stripping, or a combination of both. The leg should be elevated to reduce the edema. Lumbar sympathectomy may aid in selected cases.

Fig. 4A. Old thrombophlebitis ulcer. Treated as described in figure 3.

Fig. 4B. Final result.

POSTPHLEBITIC ULCERS

These lesions always destroy the deep fascia. Usually they are more extensive than varicose ulcers, and often they encircle the ankle. Gross edema and infection are usually present, extending downwards in some cases to involve the periosteum.

These patients should all have the circulation of the lower extremity tested with a "lumbar block." If circulatory improvement is noted in this test, lumbar sympathectomy should be carried out prior to excision of the ulcer (figure 4).

In addition to the local covering, the postphlebitic syndrome must also be given consideration. It must be remembered that the original thrombosis of the deep veins produces ambulatory venous hypertension. This is because of the incompetent valves of the deep, superficial, and communicating systems of veins. To compensate for the venous deficiency, the patient should wear a two-way stretch elastic stocking. This stocking should have a heel, and extend well above the knee. It must be worn when the patient is ambulatory as long as there is any tendency for the extremity to swell.

ARTERIOSCLEROTIC ULCERS

Ulcers of this type always extend through the deep fascia. Because of extremely poor vascularity, extensive necrosis of the ulcer edges is usually seen. Exposed tendons and bone may likewise be encountered.

Nearly all of this group are helped by a preliminary sympathectomy. And because of the extensive infection and necrosis present, the wounds must be debrided and "cleaned up" prior to excision.

After adequate preliminary treatment of varicose, postphlebitic, and

Fig. 5A. Bilateral leg ulcers due to x-ray necrosis. These were excised and fresh granulations allowed to develop in the surgical defects. Two weeks later these areas were covered with split-thickness skin grafts.

Fig. 5B. Healed appearance one year after surgery.

arteriosclerotic ulcers, they are then excised back into areas of better circulation. Drilling or decortication of the underlying bone may further improve the local blood supply. While flap covering the fresh open wound is usually desirable, it must be remembered that this variety of lesions is usually found in an older age group who cannot stand the rigors involved in a major pedicle flap transfer. As a compromise, the open defect usually is closed with a split-thickness skin graft. Although this may not give the most desirable covering, it is usually adequate if the patient is reasonably careful.

RADIATION INJURIES

Excessive radiation therapy produces an endarteritis, hyalinization, and obliteration of all the vessels in the damaged area. This pathology is progressive and irreversible so that progressive diminution in blood supply will ultimately produce necrosis and chronic ulceration. Many of these lesions are associated with severe pain and itching.

The only method of treatment is wide excision through a level of good blood supply in unirradiated tissues. This step will also bring about a dramatic and permanent relief of the pain and itching. The resulting surgical wound is then covered with either a split-thickness skin graft (figure 5) or pedicle flap as indicated. Because of the local circulatory damage, a pedicle flap is frequently necessary.

CARCINOMA

Any chronic open wound that is associated with fibrosis, scarring, and poor blood supply may ultimately degenerate into a squamous cell carcinoma.

Most frequently those are associated with chronic radiation ulcers. Next in frequency are those developing in chronic ulcers following unhealed third degree burns and are commonly known as Marjolin ulcers. Squamous cell degeneration is occasionally seen in an old untreated varicose ulcer.

Treatment consists of wide local excision and closure with either a split-thickness skin graft or pedicle flap as indicated. The inguinal and femoral lymph nodes on the corresponding side should also be removed if palpable. If none can be felt, the patient must be kept under close observation for several years. Should any lymph node swelling occur at a later date, biopsy study is indicated, and if positive for metastatic carcinoma, resection of all femoral and inguinal glands must be carried out.

CONCLUSION

1. The majority of chronic ulcers of the lower extremity fail to heal because of poor local blood supply in an area whose basic circulation is comparatively deficient even under normal conditions. Chronic fibrosis associated with long-standing untreated burns and avulsions, compound fractures, varicosities, phlebitis, arteriosclerosis, excessive irradiation, and carcinoma produces further diminution of blood supply to the leg.
2. Treatment of chronic leg ulcers consists of wide excision, after which the resulting surgical defect is covered with a split-thickness skin graft or pedicle flap. When indicated, these procedures should be preceded by a lumbar sympathectomy and elimination of varicosities if present.
3. The choice of skin grafting methods is taken up and discussed in relationship to the different types of pathology needing coverage.

AGING may be defined as a process of unfavorable progressive change, usually correlated with the passage of time, becoming apparent after maturity and terminating invariably in death of the individual, but from the clinical point of view one almost never encounters aging as a cause of death. No one dies from true aging; he dies of complications which accumulate with advancing years—the so-called degenerative diseases, cardiovascular disease, and so on.

KARL L. SWIFT, M.D.

Prevention of Arteriosclerosis*

Campbell Moses, M.D.

WHILE at this time no reliable clinical method for the prevention of arteriosclerosis is known, considerable data on the mechanisms involved in its pathogenesis are available. In this paper an attempt is made to summarize briefly the present state of our knowledge and to relate it to clinical application today.

From a practical point of view, two factors are of outstanding importance in the development of arteriosclerosis: (1) the cholesterol in the circulating blood, and (2) the stress and strain on the arteries carrying the cholesterol. While there is much debate about the specific details relating to these two factors in the deposition of lipoid in the arterial wall, there is general agreement that these factors are of prime importance.

CHOLESTEROL AND ARTERIOSCLEROSIS

THE EARLIEST pathologic lesion to appear in atherosclerosis is the deposition of lipoid material beneath the endothelium of the intima. Bevans[1] observed that even at this early stage the lipoid is found in this area in star-shaped connective tissue cells, in tissue spaces, and in macrophages with a foamy cytoplasm. Somewhat later dissolution of some of the macrophages occurs, and cholesterol and fatty acid crystals are found in the layers of the intima. This is followed by a degenerative change in the adjacent fibrous tissue characterized by breaking up of the fibrillar strands into a granular substance and intimal thickening above the deposit. The mechanisms underlying this lipoid deposition are not well understood. Aschoff[2] held that the procedure was due to simple imbibition. Leary[3] felt that it was caused by invasion of the subendothelial layer by lipoid-containing foam-cell macrophages from the liver. Virchow[4] believed that altered permeability of the intima was an important factor in the development of arteriosclerosis. Hueper[5] produced atheromatous lesions resembling experimental cholesterol atheromatosis by the intravenous administration of a variety of macromolecular colloidal carbohydrates such as polyvinyl alcohol, methyl cellulose, and pectin. He indicated that the atheromatous process is initiated by precipitation of a film on the intimal surface, and the resulting anoxic injury to endothelial cells leads to increased intimal permeability in the form of subintimal lipoid atheromas. Thannhauser[6] has emphasized that two processes of cholesterol accumulation in the arterial tissue should be distinguished: (1) that in which the intracellular accumulation of cholesterol from the serum is the primary cause

CAMPBELL MOSES, *a 1941 graduate of the University of Pittsburgh School of Medicine, is director and associate research professor of Addison H. Gibson Laboratory, University of Pittsburgh School of Medicine and is on the staff at Presbyterian and Woman's Hospitals, Pittsburgh.*

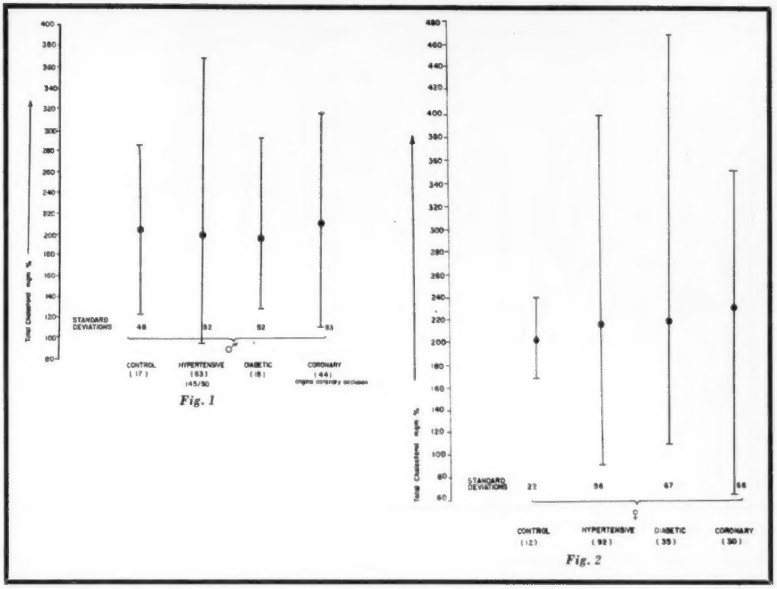

Fig. 1

Fig. 2

of the arterial lesion, and (2) that in which extracellular precipitation and crystallization of cholesterol occurs in a primarily altered arterial tissue in which the extracellular precipitation of cholesterol occurs independently of the cholesterol level of the serum.

It should be noted that despite the fact that cholesterol is intimately related to the development of atherosclerosis and despite the reports of several investigators that the mean cholesterol level tends to be elevated in patients with clinical evidence of arteriosclerosis,[7-9] this does not mean that the cholesterol level itself is a reliable index as to the presence of arteriosclerosis.[10] While the mean values for total cholesterol are higher for patients with coronary arteriosclerosis, it will be noted that there is considerable overlapping in the total cholesterol level between normal and arteriosclerotic subjects[80] (figures 1 and 2).

The mechanisms responsible for the lipid deposition in atherosclerosis are not clearly established. Ahrens and Kunkle[11] have particularly emphasized the role of the serum phospholipids in the stabilization of serum lipid emulsions, and other investigators have indicated that the cholesterol-lipid phosphorus ratio may provide a reliable clue as to the presence of atherosclerotic vascular disease.[12] Other investigators, notably Peters[13] and Jackson and Wilkinson,[14] emphasized that the cholesterol-lipid phosphorus ratio is no better as a diagnostic tool than are total cholesterol levels alone. A recent

*Presented at the American Medical Association Meeting, Denver, Colorado, December 3, 1952.
Portions of the work included in this report were made possible by grants from the United States Public Health Service, The Western Pennsylvania Heart Association and the Sarah Mellon Scaife Foundation.

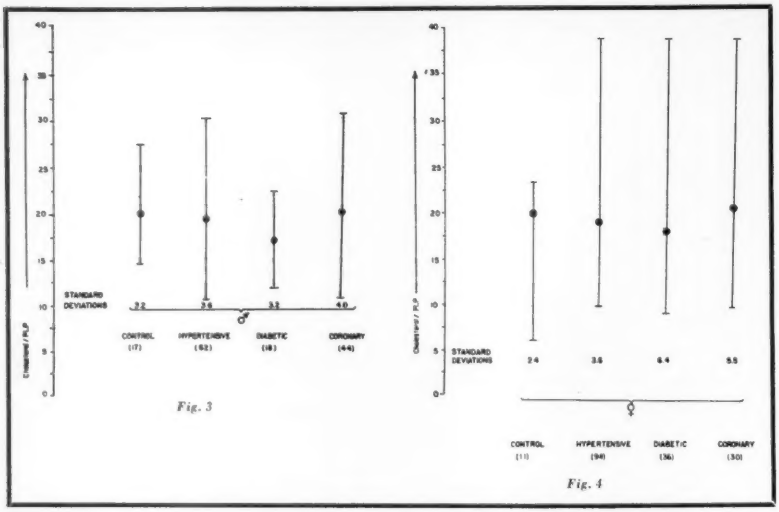

Fig. 3

Fig. 4

report from this laboratory[80] indicated there also is overlapping in the mean values of the cholesterol-lipid phosphorus ratio and that this value must be interpreted quite cautiously as to its significance in any individual (figures 3 and 4).

Recently, there has been increased interest in the role of certain large cholesterol-containing lipoprotein molecules in the pathogenesis of arteriosclerosis.[15] While there can be no doubt that the cholesterol contained in these giant lipoprotein molecules is important as a fat transport mechanism, the diagnostic significance of the Sf 12-20 concentration in determining the tendency for the development of atherosclerosis may be quite another matter, and because of the range of values found in individuals with and without vascular disease, it is difficult to assess the significance of a single Sf 12-20 reading (figures 5 and 6).

STRESS AND ARTERIOSCLEROSIS

DESPITE the difference of opinion as to the mechanisms responsible for the lipoid deposition in atherosclerosis, there can be no doubt that the intravascular arterial pressure contributes to both the extent and the distribution of these lesions. In experimental atherosclerosis, the arch of the aorta is by far the most vulnerable site for the development of this lesion. This is, of course, the portion of the aorta subject to the direct impact of the systolic force of the left ventricle. It is also one of the most frequent sites for the early development of clinical atherosclerosis in contrast to the relative freedom from arteriosclerosis of the more mobile portions of the aorta.[16]

In man the coronary arteries are particularly susceptible to arteriosclerosis. This has been related to the unusual phasic variations in intracoronary

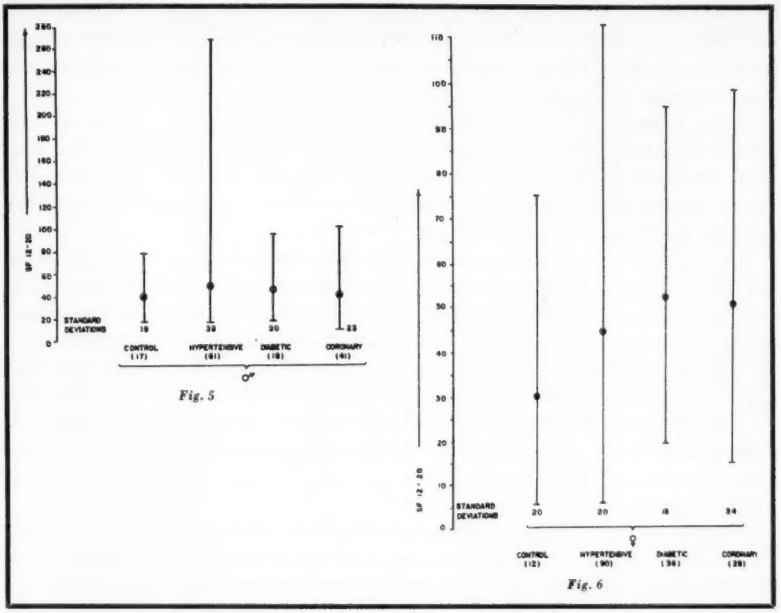

Fig. 5

Fig. 6

pressure that occur due to ventricular systole and diastole. With ventricular systole and subsequent decrease in coronary blood flow, there is a sharp rise in the systolic pressure head in the extramural coronary arteries, thus increasing the stress on these vessels and facilitating the development of atherosclerosis. The tendency for arteriosclerosis to develop in the extramural coronary arteries is in sharp contrast to the resistance of the intramural portion of these vessels to this lesion. Perhaps, this is because of the firm supporting stroma in which the intramural portion lies and is, therefore, not subject to such sharp stress and strain. Likewise, arteriosclerosis regularly develops more quickly in the left coronary rami as these are subjected to higher pressures than are those occurring in the right coronary branches.[17]

It should be noted that the same stresses which tend to increase the development of atherosclerosis may also serve to precipitate the catastrophes that occur in this disease as the edge of a plaque may be torn readily away, acting as an embolus in narrower, more distal portions of the vessel. Paterson[18] has emphasized particularly the dislocation of these plaques by subendothelial hemorrhage in the pathogenesis of coronary disease.

TIME-STRESS-CHOLESTEROL RELATIONSHIPS

ALTHOUGH it has long been known that arteriosclerosis is not synonymous with the aging process—young adults may show rather marked vascular lesions and older patients may demonstrate minimal evidence of this disorder

—only recently has it been fully appreciated that atherosclerosis may develop in very brief intervals of time. Bevans[1] noted that in most sclerotic vessels there are early artheromatous plaques and old calcified lesions side by side, and she suggested that arteriosclerosis may be a reaction to discontinuous stimuli which may occur at any time in the life of an individual. Holman,[20] from both an experimental and clinical point of view, has indicated that arteriosclerosis is a disease which develops as a result of intermittent insults to the aortic wall leaving anatomic changes which differ somewhat according to the number of injuries.

In our laboratory, we have demonstrated that in rabbits and dogs with experimental hypercholesteremia of very short duration, the production of kidney damage by the intravenous administration of uranium acetate or nephrotoxic sera resulted in the prompt development of atherosclerotic lesions in the aorta.[21] Wakerlin[22] has demonstrated in dogs the well-recognized clinical observation that artherosclerosis occurs more rapidly in the presence of hypertension. The evidence is clear, however, that experimentally and probably clinically, it is possible for atherosclerotic lesions to develop over brief intervals of time, and it is not necessary to postulate long-continued insult to produce arteriosclerosis.

A new aspect of this problem was raised by the report of Hartroft and Best[23] that weanling rats surviving renal damage resulting from a brief period of choline deficiency have a high incidence of hypertension. The concept that a short-lived dietary deficiency in early life might have a pronounced effect on the incidence of vascular disease at maturity, while intriguing, has not been demonstrated in other species. However, the possibility of such effects must be considered.

CHOLESTEROL AND THE PREVENTION OF ATHEROSCLEROSIS

THEORETICALLY at least, the maintenance of a low blood cholesterol would tend to delay the development of arteriosclerosis. Practically, this is a goal difficult or impossible to achieve. Great variations in the cholesterol content of the diet have been found to exert a minimal effect on the blood cholesterol level.

Several reasons for this phenomenon are apparent. On a normal diet, the cholesterol intake varies from 200 to 360 mg. a day.[24] Provided there is a normal amount of fat in the diet, almost all of this cholesterol is absorbed. In addition to this, approximately 300 mg. of cholesterol are synthesized daily by the liver.[25] The demonstration initially by Bloch and Rittenberg[26] and later by Gould[27] and Brady and Gurin[28] that the body synthesized cholesterol from such small radicles as acetate, effectively indicated that so far as the body is concerned, the blood and tissue cholesterol may have as their ultimate source noncholesterol-containing foods from the diet. The observations of Chaikoff[29] provide additional weight to this concept by demonstrating that atherosclerosis may develop in birds on a diet totally devoid of cholesterol, and cholesterol may be synthesized in the artery wall itself.

Perhaps because of the overwhelming evidence demonstrating the relationship between cholesterol and atherosclerosis, many clinicians and investigators have been beguiled into placing similar significance, so far as the development of arteriosclerosis is concerned, on the words "cholesterol" and "dietary cholesterol." Because of the ability of the body to synthesize cholesterol from noncholesterol-containing foodstuffs, modest changes in the cholesterol content of the diet are singularly ineffective in influencing serum cholesterol levels. Keys and associates,[30] in studying a large number of healthy males on a diet containing either less than 2 or more than 3 gm. of cholesterol per week, demonstrated that the blood cholesterol level is independent of the intake over a wide range. However, with approximately zero cholesterol intake, the blood cholesterol level falls at a level related to the initial height of the blood cholesterol level.

In studying a kindred of essential familial hypercholesteremia, Wilkinson[31] demonstrated no relation between the absolute amount of carbohydrate, fat, protein, and cholesterol in the diet and the level of the total serum cholesterol. The present author[32] studied the changes in total serum cholesterol, cholesterol esters, and lipid phosphorus in 35 young pregnant women on an accurately recorded diet from the fifth month of pregnancy to term and in 35 similar women on the same diet plus 2 additional gm. of cholesterol supplied in chocolate candy.

This quantity of cholesterol is approximately equivalent to the cholesterol contained in 2 eggs plus 4 qts. of milk, 8 pats of butter, and 1 lb. of fat meat daily. No discernible rise occurred in any of these lipid fractions over that observed in a normally fed group. Furthermore, no alteration in the level of Sf 12-20 molecules was induced in these pregnant women by feeding 2 gm. of additional cholesterol. It is clear from the work of Kempner[33] and Starke[34] and Keys[30] and Hatch and Kendall[35] that cholesterol restriction must be very severe if a reduction in serum cholesterol levels is to be achieved.

It should be noted that the fat which is necessary for the absorption of dietary cholesterol also provides acetate for the synthesis of cholesterol by the liver. Therefore, if the diet is to be effective in lowering the blood cholesterol, it must be low not only in cholesterol but also sharply restricted as to fat. Such diets are of course unpalatable, and little information is available on the changes in blood cholesterol that accompany the long-continued use of such a regimen. Kempner's report[33] describing 79 patients on the rice diet with a fat content of less than 5 gm. per day revealed an average fall in serum cholesterol of 57 mg. per cent. This is a statistically significant fall in serum cholesterol. Hatch and Kendall[35] in a similar experiment using the rice diet in hypertensive patients demonstrated a significant fall in cholesterol esters and a rise in neutral fat and an equivocal response so far as the Sf 12-20 molecules are concerned.

Recently Keys[36] reported on subjects living in England, Naples, and Madrid on diets sharply differing in the proportions of the total dietary calories derived from fat. His data indicate that a diet in which not more than 20 to 25 per cent of the calories are derived from all kinds of fats may

be effective in maintaining a low serum cholesterol level as a reasonable measure in reducing the incidence of atherosclerosis.

LIPOTROPIC AGENTS

Several investigators have found choline,[37] methionine and inositol,[38] as well as betaine,[39] lipocaic,[40] and potassium iodide,[41] delay significantly the development of atherosclerosis in experimental hypercholesteremia. However, in our laboratory, when, as pointed out by Firstbrook,[42] careful attention is paid to the changes in body weight in animals in which the antiatherosclerotic effect is being studied, no striking effects from choline,[43] potassium iodide,[44] or vitamin E[45] have been demonstrated.

Similarly in man, it has been indicated that these lipotropic materials are more or less beneficial in the prevention and treatment of arteriosclerotic vascular disease by lowering the serum cholesterol levels.[46] However, when the experiments are rigidly controlled and the period of observation long enough to include the spontaneous variations in cholesterol level that occur during long-continued observation, no beneficial action of these agents can be demonstrated.[47]

It should be noted that while the efficacy of these agents in mobilizing fat from the liver of animals suffering from dietary deficiency has been incontrovertibly established, it is a considerably different proposition to expect the same lipotropic materials to cause the mobilization of cholesterol from abnormal sites of deposition in the arterial wall in humans on an adequate diet.

In any discussion of lipotropic agents, it should be emphasized that dietary deficiencies, particularly of protein, may play a significant role in influencing cholesterol deposition. This has been particularly emphasized by Mann[48] and associates, whose work points out that specific protein deficiencies in monkeys may rapidly exaggerate the rate of development of atherosclerotic lesions. Barr and associates[49] are particularly impressed with variations in protein-lipid relationships in altering the rate of development of atherosclerosis. Similarly, Rinehart[50] has called attention to the significance of pyridoxine deficiency in the development of atherosclerotic lesions in man and monkeys.

OTHER DRUGS

In view of the demonstration of the role of serum phospholipids in the stabilization of serum lipid emulsions,[11] the use of lecithin and albumin[51] has been suggested to prevent the depositon of cholesterol on the arterial wall. The data from these experiments so far as the prevention of arteriosclerosis is concerned are too meager to permit any proper evalaution of the work.

Following the demonstration by Hahn[52] that the injection of heparin caused pronounced reduction of alimentary lipemia, considerable interest was evoked in the use of this drug for the prevention and treatment of coronary atherosclerosis. While one worker is enthusiastic about this technic,[53] there is little evidence that in well controlled studies any beneficial clinical effect is produced.[54,55] However, it should be noted that experimentally long-

continued heparin administration definitely influences lipoprotein metabolism[56] and decreases the rate of development of experimental cholesterol atherosclerosis.[57] Other anticoagulants[58] have also been suggested in this regard. A hyaluronidase inhibitor, phosphorylated hesperidin,[59] recently was suggested as a potentially useful agent for the prevention of cholesterol deposition on the intimal surface. An organic compound which selectively prevents the intestinal resorption of cholesterol was described by Pollak.[60] In all of these situations, it should be emphasized that very careful clinical observations and adequate control of the experimental situation are necessary.

HORMONES AND ATHEROSCLEROSIS

THE DECREASED incidence of atherosclerosis in women below the menopausal age and the rapidly increasing incidence after this period has long been noted.[61] Barr[49,62] demonstrated a distinct difference in the alpha and beta lipoprotein distribution in young women when compared to normal men and women between the ages of 45 and 65. Recently, he[63] explored the effects of estrogen and androgen administration on the lipoprotein partition and noted that estrogen alters this pattern toward that seen in young women who are unlikely candidates for atherosclerosis.

Ackerman and associates[64] found in a study of the hearts of 600 women considerably less atherosclerosis than in a similar group of men. Even in women, however, with increasing age there was increasingly serious atherosclerosis as the number of hearts with severe damage rose steadily from 5 per cent in the fourth decade to 60 per cent in the eighth and ninth decades. The increased development of atherosclerosis in bilaterally oophorectomized women was recently reported.[65]

It is generally accepted that hypothyroidism is frequently accompanied by hypercholesterolemia and atherosclerosis. Indeed, in dogs it has been necessary to depress thyroid function[66] to produce atherosclerosis in cholesterol fed dogs. Conversely, thyroid feeding has not met with startling success in lowering cholesterol levels,[67] although it may alter the lipoprotein pattern.[68]

Other endocrine factors probably also play a role in the pathogenesis of arteriosclerosis[69] especially since serum cholesterol may be a precursor of the adrenal cortical hormones.[70] Related to this also is the demonstration that cortisone and adrenocorticotropic hormone may produce changes in serum cholesterol levels[71] and alter the rate of development of experimental atherosclerosis.[72]

OBESITY AND ATHEROSCLEROSIS

IT IS generally conceded that the death rates among the very obese from cardiovascular disease are considerably higher than the rates in individuals of normal weight. Wilens[73] found in a large series of necropsies that in the coronary arteries almost twice as many of the poorly nourished group as the obese group have little or no atherosclerosis. However, Faber and Lund[74] in studying the aorta in obesity were impressed with the data that obesity

increased the incidence of diabetes and hypertension and only indirectly through these means increased arteriosclerosis. Garn and associates[75] compared 97 men under age 40 who had experienced myocardial infarction with 146 healthy men of comparable age and failed to find that men under 40 who had had myocardial infarction were more overweight or obese than the healthy group.

Closely related to the problem of obesity and atherosclerosis, of course, is the genetic background of the individual.[76] The evidence on this aspect also tends to confirm the validity of separating obesity and hypertension as pathogenetic factors in the development of atherosclerosis.[77]

In view of the recognized psychologic[78] and perhaps even neuro-endocrine[79] factors in the pathogenesis of hypertension and obesity, it should be emphasized that the interplay of emotional factors resulting in hypertension and/or obesity may provide the proper stimulus for the rapid accentuation of the atherosclerotic process. Since it has been demonstrated[21] that atherosclerosis may develop rapidly, it must be concluded that relatively brief, acute episodes of hypertension, whether induced emotionally or by some other factor, may cause the abrupt development of dangerous atherosclerotic lesions.

SUMMARY

The rapidly increasing clinical problem of arteriosclerosis has resulted in a sharp stimulus to research interest in this field. While as yet no reliable clinical method for the prevention of arteriosclerosis is known, the established facts relating to this problem are summarized. Two factors are of outstanding importance in the development of arteriosclerosis: (1) the cholesterol in the circulating blood, and (2) the stress and strain on the arteries carrying the blood.

With the development of atherosclerosis, the cholesterol from the blood is deposited on the arterial wall and corrodes the smooth intimal lining of the blood vessels. This deposition is exaggerated by high blood pressure and the stress on the arterial wall. High blood cholesterol levels also tend to increase this cholesterol corrosion.

This does not mean that the finding of a high blood cholesterol or other lipid level definitely establishes the diagnosis of clinical atherosclerosis. Evidence is presented demonstrating the overlapping between the total serum cholesterol level, the serum lipid phosphorus, and the Sf 12-20 lipoprotein concentration that occurs in normal and atherosclerotic subjects.

While arterial hypertension and stress exaggerate the intimal cholesterol deposition and corrosion, it is indicated that these lesions may develop in very brief intervals of time and do not require months or years for their development. Since acute emotional stress may induce hypertension, the life situation which makes a man react with a rise in blood pressure accentuates the rate of development of arteriosclerosis in his blood vessels.

It is not possible to lower the cholesterol level of the blood unless only a very small amount of both animal and vegetable fat is eaten as well. As the human body needs cholesterol to provide various hormones, cholesterol deficits from the diet are replaced by the synthesis of cholesterol in the liver. A portion of this synthesized cholesterol is excreted in the bile and is normally reabsorbed with the aid of fats from the diet. If no fat is available in the intestine for the reabsorption of this cholesterol, cholesterol deficits and low blood cholesterol levels may develop.

Lipotropic drugs such as choline, methionine, and inositol exert no demonstrable effect on clinical or experimental atherosclerosis although they are lipotropic to fatty livers induced by dietary deficiencies.

Heparin and other anticoagulants have been shown to alter the plasma lipid pattern and to decrease experimental rabbit atherosclerosis.

The decreased incidence of atherosclerosis in women under 45 years of age is noted. The role of estrogens in this effect is perhaps related to their alteration of the lipoprotein partition.

While the adverse effect of obesity on the development of cardiovascular disease is recorded, it is indicated that the development of atherosclerosis in obese patients may be due to the increase in diabetes and hypertension in these patients and not to any direct relationship between obesity and atherosclerosis.

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Pinning Hip Fractures in the Aged

H. E. Hipps, M.D.

THE MORTALITY rate in old people with fractures of the hip is still too high, largely because of the length of the operation and loss of blood, and it has not been lessened by the new plastic or Vitallium prosthesis arthroplasty.

The method of reducing and fixing intracapsular fractures of the neck of the femur to be described in this paper is safe, rapid, accurate, and there is no blood loss.

An incision is not necessary and the time required for reduction and fixation is usually no longer than twenty to thirty minutes.

Since 1948, I have operated upon 56 patients with single hip fractures without a single death occurring because of the fracture. Ages of these patients ranged from 60 to 78, and good union occurred in more than 87 per cent of the cases.

Instruments needed include 3 or 4 Steinmann pins 9 in. long and ⅛ in. in diameter—flat tip type; 1 web belt 12 ft. long and 1 in. wide; 1 pin cutter; 1 hammer; 4 towel clips; and sometimes, 1 drill. A flat tip Steinmann pin is preferred because it will not rotate so easily in the bone and thus become loose.

PROCEDURE

THE PATIENT is placed supine on an x-ray table. An anesthetic is administered, which is usually Pentothal Sodium induction, followed by oxygen and nitrous oxide. The web strap is placed in the groin on the side of the unbroken leg. The other ends of the strap are buckled around the anesthetist's back (figure 1). This affords countertraction and at the same time helps tilt the pelvis up on the unbroken side and down on the broken side, placing the broken hip in a position of abduction, so that when reduced, the head will be set on the neck in a desirable valgus position.

The skin of the hip area is prepared. Four sterile towels are pinned to the skin with towel clips, outlining the troehanteric area. The table is covered with a large drape with a hole in it.

A sterile pillow case with a six-inch diameter hole in one side of it is carefully placed over the fluoroscopic screen. The open end, the edges, are held together at the back edge of the screen with two forceps, safety pins, or a draw string. The hole is placed on top of the screen. The screen is now com-

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HERBERT E. HIPPS, *a 1929 graduate of Baylor College of Medicine, did graduate work in Vienna and is now chief of surgery at Crippled Children's Hospital, chief of the orthopedic staff at Hillcrest Memorial Hospital, and on the staff of Providence Hospital, all in Waco, Texas.*

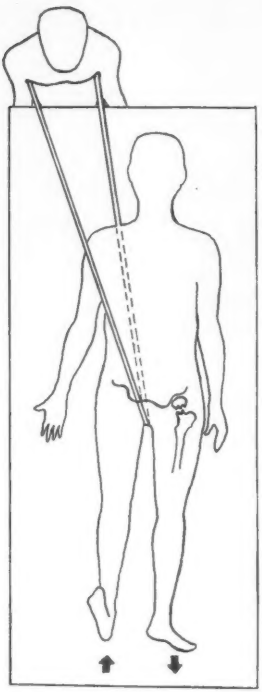


Fig. 1

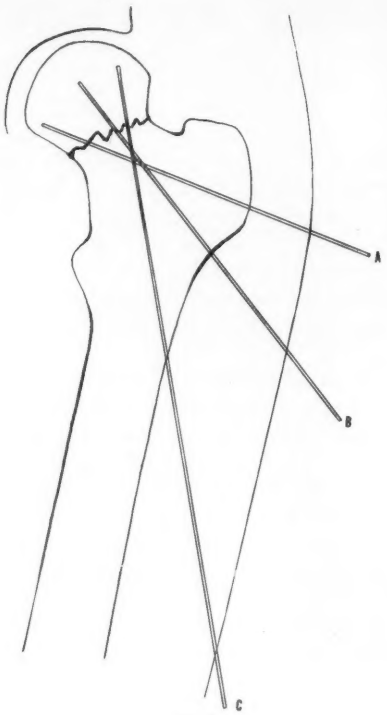


Fig. 2

pletely covered on its under surface and it can be placed against the other sterile drapes or against the hip without contamination.

REDUCTION OF FRACTURE

HEAVY TRACTION is made on the broken leg with the leg in external rotation. At the same time, the bottom of the foot of the good leg is pushed upward. This maneuver helps force the pelvis downward on the side of the broken leg, so that the hip when reduced will have the head resting on the neck in a valgus position (figure 1).

After two or three minutes of heavy continuous traction, the broken leg is internally rotated with force. While still maintaining traction and full internal rotation, the leg is abducted to the edge of the table. The fracture is now reduced and most of the traction can be released, but extreme internal rotation must be maintained constantly. The position is checked with a quick look through the fluoroscopic screen. The limb is held in internal rotation with slight traction until the first pin has been properly placed.

FIXATION OF FRACTURE

A STEINMANN pin is pushed through the skin over the most prominent part of the greater trochanter. An incision is not made. Then, under fluoroscopic guidance, the pin is driven with a hammer through the greater trochanter and through the neck and aimed at the *bottom* of the head of the femur (figure 2*a*).

The pin must be kept parallel to the top of the table. When the femur is rotated inward as far as possible, the neck of the femur lies parallel to the top of the table. If the pins are kept parallel to the top of the table as they are introduced, they will be correctly placed on the lateral view.

The pin must enter the greater trochanter directly on its most lateral convex part, midway between the front and back of the bone. Short, quick-screened fluoroscopic views are used in order to avoid x-ray irritation.

The head of the femur is loose in the socket. It moves a little when the first pin hits it. The pin thrust, hitting the bottom of the head, forces the head into a valgus position on the neck, which is highly desirable (figures 2 and 3).

Still with fluoroscopic control, this pin is driven about one-fourth of an inch into the head of the femur. When the pin is placed in proper position and depth, the assistant is instructed to release all traction but to hold the leg in internal rotation. Now, the fracture is impacted by hammering on the greater trochanter over a folded towel (figure 4). The leg must still be held in internal rotation while doing this.

Next, another pin is inserted about one-fourth to one-half of an inch below the first (figure 2*b*). It too should be on the extreme lateral margin of the trochanter, and should start near the base of the trochanter. It should be aimed at about the middle of the head, and kept parallel to the table top. Again, a hammer is used to drive the pin in. If a pin is drilled in, it will become loose. If driven in, it is tight and is not apt to become loose. The position of the pin in the head is checked with the fluoroscope. It should be in the head about one-fourth of an inch.

Now, the bottom pin is inserted (figure 2*c*), and should enter the bone about one-half an inch below the base of the greater trochanter. It should enter the bone directly on the lateral aspect. The bone here usually is hard, and it may be necessary to use a drill to make the hole into the bone through which the pin is thrust. The hole is made first directly into the bone at a right angle. Then the pin is pulled back a little and reinserted in this same hole at an oblique angle, and again the pin is driven or drilled so that the hole will be oblique. This pin must go through the inferior portion of the neck, where the bone is hard, and then up into the head of the femur a little more than one-fourth of an inch. This is the most important pin used, and should be placed in as nearly a vertical position as possible so that it will hold the head on the neck securely (figures 2*c* and 5). If this pin were introduced first, it would push the head into a varus position, which is why it must be placed last. The pin, again, must be kept parallel to the top of the table as it is being introduced.

Now the hip is viewed in a lateral projection with the fluoroscope. To do this, the assistant holds the patient's heel with one hand. With the thumb of this hand, he can grasp the sterile drape to prevent it from sliding upward when the knee is flexed. His other hand can be slid under the calf of the leg to the back of the knee. This knee is then flexed straight upward and when the hip is flexed at an angle of about 75 or 80 degrees, the leg is abducted. This is, for practical purposes, a satisfactory lateral view.

It is desirable at this point to have two x-ray films made, an anteroposterior and a lateral to determine accurately the depth of the pins in the head. If one of the pins is not deep enough or is, perhaps, a little too deep, suitable correction can be made.

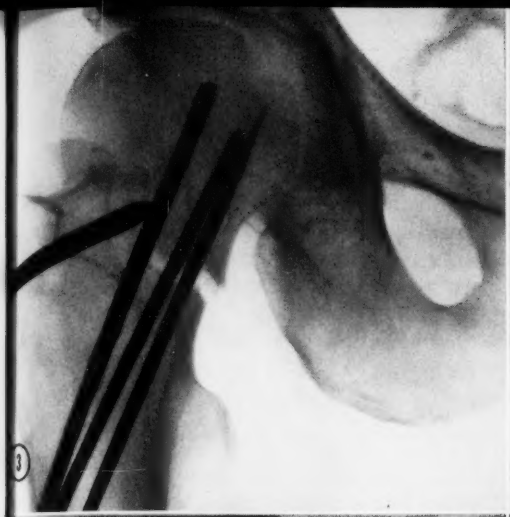
Next, the protruding parts of the pins are cut off. The pin cutter is pushed against the skin firmly to push the skin inward as much as possible. Then the pin is cut off. After all three pins have been cut off, a towel clamp may be used to grab hold of the skin and pull it outward. This leaves the ends of the pins about one-half to three-fourths of an inch underneath the skin. A small dressing is applied over the pin holes. Wide tape must be placed around each margin of this dressing to keep the patient from scratching the pin holes and getting them infected.

POSTOPERATIVE CARE

THE patient is returned to his or her room, and an overhead bar is placed over the bed. A sling is placed under the leg near the ankle and a rope is attached to this. This rope runs upward to a pulley on the overhead bar, through the pulley, and the other end of the rope goes back to the head of the bed. A small cross stick is placed on the end of this rope. The patient is required to lift the leg, by using this rope-pulley-sling device, about two or three inches off of the bed and to exercise the hip in abduction hundreds of times every day. He must exercise it by *actively abducting the leg with his own muscles* and letting it fall toward the midline. *He must not pull the leg toward the midline* with his own adductor muscles, but must let it fall passively toward the midline. This constant abduction exercise continually impacts the head of the femur on the neck, whereas adduction tends to pull the head out of its valgus position. This is most important. Also, he should be instructed to keep the leg in abduction when it is at rest.

The patient may turn from his back to the prone position or may lie on the side of the unbroken leg. He must not lie on the side of the broken leg because this position may push the pins in too deep, or they may penetrate the skin.

Fig. 3. Shows how top pin helps push head into valgus position.
Fig. 4. Why impaction is necessary.
Fig. 5. Desired position for bottom pin, as near vertical as possible.
Fig. 6. Lateral view of figure 5.
Fig. 7. Anteroposterior view showing good union with head on neck in desirable valgus position.
Fig. 8. Lateral view.



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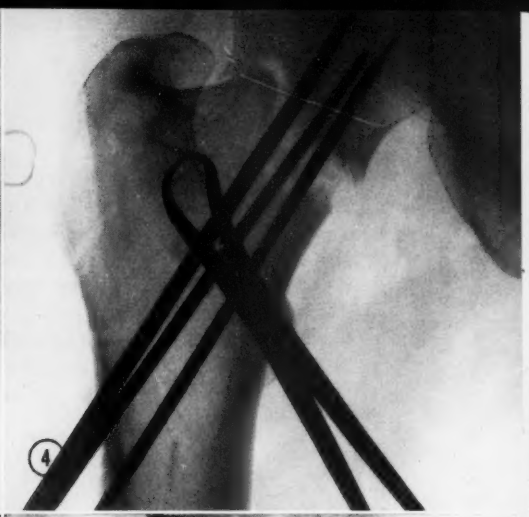

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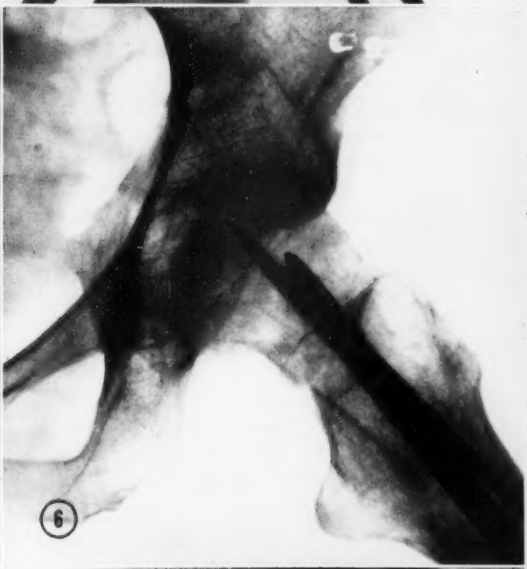

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8

The patient is allowed to go home via ambulance on the sixth or seventh day. He is not allowed to stand or walk with crutches until the roentgenograms show good union in the bone, which usually means he will be kept in bed four or five months. However, he may sit up in bed, sit with his legs over the edge of the bed, and stand by the side of the bed on the good leg, but under no circumstances should he put weight on the broken leg.

If elderly people are allowed to walk with crutches too soon, they inevitably put too much weight on the broken leg. Since the hip is not painful, patients are apt to forget and put full weight on it, or they may inadvertently do so.

The patient also, after the first four or five days, should lie on his stomach for at least an hour or two each day to prevent a hip flexion contracture. At the end of one month, the patient should return to the hospital and another roentgenogram should be made. If the position of the pins is good, he returns home and continues the exercises. Another film is made at the end of two more months. Usually this film shows some union, but not enough to permit weight bearing. Within another month, union usually appears strong enough so that the patient can begin to walk with crutches and bear a little weight on the broken leg.

About this time, one or two of the pins may become loose and may need to be removed. This can be done easily by making a small nick in the skin using a local anesthetic and pushing the skin inward, so that the end of the pin appears through the skin. Then the pin can be removed with a sterile pair of pliers. When firm, strong union is present, all of the remaining pins can be removed in this way.

COMPLICATIONS

Among this series of 56 patients, most of whom I treated at Hillcrest Memorial Hospital, Waco, Texas, 3 minor skin infections occurred, probably because the patient scratched the pin hole area. No bone infections occurred.

In 18 patients, one or two of the pins migrated outward enough at the end of one month so that it was deemed wise to send the patient back to the hospital for a day in order to reinsert the pins in another place.

In 3 patients, all the pins slipped out enough by the end of six to eight weeks so that the good position of the fracture was lost. These patients were also returned to the hospital and the pins reinserted in a new location.

In one case, one of the pins was pushed inward into the acetabulum after the patient left the hospital. This pin was removed.

Irritation of the skin with some pain occurred in 29 patients, caused by the ends of the pin rubbing against the under surface of the skin. In some of these cases I found the patient held his leg tightly in too much adduction, thus drawing the skin tightly over the ends of the pins. Discomfort ceased when the leg was kept in abduction. One patient complained only when lying on the unbroken side. This position caused the broken leg to go into

the undesirable adduction position. Pain was relieved by placing three or four pillows between the knees to keep the leg in abduction.

Nonunion occurred in 7 patients but in these cases there were complicating factors such as a preexisting rheumatoid arthritis, marked decalcification of bone, pellagra, and senile dementia.

DANGERS

THE patient is in less danger with this procedure than with any other method of reducing and fixing fractures. Since there is no incision, no loss of blood occurs and the time required is much less than with any other method.

The operator runs the risk of having his hands irritated by too much x-ray exposure, but this can be minimized if short, quick, screened views are made.

CONCLUSION

A NEW and satisfactory method of reducing and fixing intracapsular fractures in an elderly person is presented. No special tools or apparatus are necessary. No incision is required and the operation seldom takes more than thirty minutes. Union occurred in over 87 per cent of cases. The operation is so simple that any surgeon with a reasonable amount of surgical experience can perform it successfully.

Brain Tumors in the Elderly

Charles Rupp, M.D., *Helena E. Riggs*, M.D., *H. W. Hogan*, M.D.
and James A. L. Moulton, M.D.

WITH increased longevity, the incidence of brain tumors in persons past 60 is rising. Several factors contribute to the failure to diagnose brain tumors in elderly patients. Concomitant cardiovascular disease is the chief of these.

Neurologic and psychiatric deterioration are often accepted as normal in the elderly, and neurologic symptoms are often erroneously attributed to vascular disease.

On admission to the hospital, the neurologic condition may be so far advanced that adequate study is impossible.

Differentiation between cerebral vascular accidents and tumors may be aided by the fact that hemiplegia in tumors is usually progressive; in vascular accidents paralysis is maximal early in the course.

In general, brain tumors in the elderly are seldom amenable to successful therapy because of the deteriorated condition of the patients.

Primary brain tumors in patients over age 60. Neurology 3: 586-590, 1953.

Radiation Therapy for Bronchogenic Carcinoma*

Hugh F. Hare, M.D., *Carlton R. Souders,* M.D., *Maurice Cote,* M.D., *J. G. Trump,* D.SC., *Richard C. Granke and K. A. Wright*

RADIATION therapy for bronchogenic carcinoma is a useful adjunct in the treatment of advanced cases of bronchogenic carcinoma to stop bleeding, to lessen severe chest pain, and for other reasons of symptomatic relief. It is well recognized that when patients with carcinoma of the lung treated with radiation come to postmortem, there has rarely been a destructive effect on the tumor although in some cases enough radiation had been given to produce a severe radiation pneumonitis. In general, it is accepted that radiation therapy using conventional x-ray voltages is not able to deliver more than 3,000 r of tumor dose to all of the involved lung region including the mediastinal and supraclavicular nodes and that this dose is inadequate for the control of the disease.

In cooperation with the Massachusetts Institute of Technology, the Lahey Clinic has undertaken the radiation treatment of malignancies, including carcinoma of the lung, using two million volt roentgen rays.[1] Our experience with carcinoma of the lung from January 1, 1950, to February 27, 1952, was limited to 26 cases. At first the patients chosen for treatment were those with advanced disease or with lesions in regions not favorable for surgery. Although each patient had a biopsy or operation before treatment, 4 of the cases that came to postmortem were proved to be other than primary carcinoma of the lung. Nevertheless, a review of this limited clinical data shows that patients tolerate higher and more adequate doses of supervoltage radiation and that certain procedures using such radiation may significantly improve the management of patients with carcinoma of the lung.

The availability at the Institute of a two million volt x-ray source, with an output equivalent to that of 5,000 gm. of radium, made feasible the delivery of a larger quantity of radiation without damage to the skin and subcutaneous tissues. Our first step was to determine the lethal tumor dose and how rapidly this dose could be delivered to the patient and still be tolerated. We wanted to produce as little damage as possible to normal tissue and yet to cover not only the involved lung but also the mediastinum and the

HUGH F. HARE, *formerly of the department of radiology at the Lahey Clinic, Boston, is now associated with the Los Angeles Tumor Institute.* CARLTON R. SOUDERS *and* MAURICE COTE *are both with the department of radiology at the Lahey Clinic.* JOHN G. TRUMP *is director of High Voltage Research Laboratory at Massachusetts Institute of Technology.* RICHARD C. GRANKE *is radiation engineer and* KENNETH A. WRIGHT *is radiation physicist at Massachusetts Institute of Technology.*

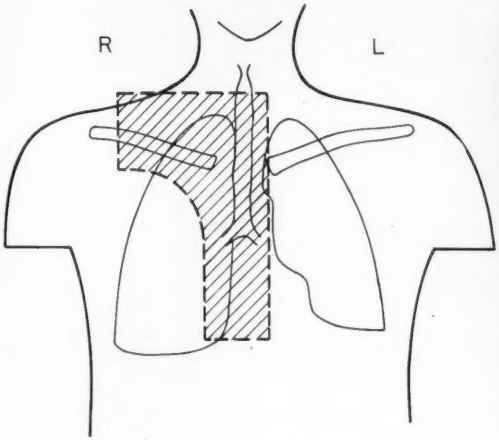

Fig. 1. See text page 556.

Fig. 2. See text page 556.

supraclavicular regions. Studies made by McCort[2,3] on lymphatic spread indicate that a wider field must be used when treating carcinoma of the left lung than when treating carcinoma of the right lung. It was also evident from our studies that the supraclavicular region on the involved side must be included in the field as well as the entire mediastinum. We decided upon a total dose of 6,000 r to be delivered in thirty-five treatment days at a rate of 170 r per day, this dose being measured at the middepth in the chest.

EARLY CLINICAL OBSERVATIONS

It became apparent after treating a few patients that this dosage was tolerated well so far as the skin and subcutaneous tissues were concerned, and many patients were relieved of their symptoms during and following treatment. When large lung areas were included in the field, however, a moderate to severe radiation pneumonitis set in usually after several months and we found ourselves several times dealing with a problem almost as difficult as the symptoms produced by the primary tumor. It also became clear that although the primary lesion and the mediastinal nodes apparently were being destroyed in patients with advanced disease, metastatic hematogenous spread usually caused the demise of the patient (table 1).

One patient who received 6,000 r in a period of thirty-five treatment days and later came to surgery died on the operating table. Postmortem examination revealed complete obliteration of the original tumor throughout the treatment field but evidence of active tumor at the periphery, which we purposely avoided treating because of the presence of a lung abscess. Two

*Read before the sectional meeting of the American College of Surgeons, Boston, Massachusetts, March 2, 1953.

TABLE 1

CARCINOMA OF LUNG—JANUARY 1, 1950, TO FEBRUARY 27, 1952
TWO MEV X-RAY THERAPY—6000 R IN 35 TREATMENT DAYS
ADVANCED PREOPERATIVE, POSTOPERATIVE, AND NONOPERABLE CASES

Case	Diagnosis	Date of Treatment	Location	Relief	Result
1	No biopsy	1/30/50	Apical	Good	Died 8/1/50: Metastatic to spine
2	Squamous	5/5/50	Hilar	Good	Died 2/3/51: Local spread
3	Cell smear positive	5/29/50	Coin	Good	Died 2/2/52
4	Epidermoid, Grade 2	9/6/50	Bronchial		Living and well 2/3/53
5		10/27/50	Rt. upper	Fair	Died 4/1/51
6	Epidermoid, Grade 2	1/25/51	Lt. lower	Good	Living; radiation pneumonia
7	Epidermoid, Grade 3	10/27/50	Bronchial		Died 3/7/52; Radiation pneumonia
8	Epidermoid, Grade 2	2/21/51		0	Died 5/3/51
9		3/24/51			Postoperative, living
10		1/11/51		None	Died 3/29/51
11	Undifferentiated	5/23/51			Died 4/8/52; Hematogenous spread
12	Epidermoid, Grade 2	5/3/51	Rt. middle		Died January 1953
13	No biopsy	6/12/51	Apical	Good	Died 11/3/51
14		6/2/51			Died 1/28/52
15	None	6/26/51	Apical	Good	Died 3/13/52
16	Epidermoid, Grade 2	7/11/51	Rt. upper	None	Died 12/6/51: operation
17	Epidermoid, Grade 3	7/20/50	Rt. middle		Died 6/11/52
18		7/27/51	Lt. upper	None	Died 11/1/51; postoperative
19		8/23/51		None	Died 4/1/52
20		10/2/51			Living, postoperative 2/1/53
21	Epidermoid, Grade 3	2/27/52			Living
22		6/12/50		Good	Living 9/12/52

other patients who received 3,000 r followed by surgical intervention almost immediately after administration of this dose still had active tumor present.

It seems fair to state that in carcinoma of the lung, the radiation dose large enough to destroy the tumor is rarely if ever achieved at 3,000 r, is attained with considerable probability at 6,000 r delivered in thirty-five treatment days, and may require even more than 6,000 r in other cases. This would indicate that with supervoltage radiation it may be possible for the first time to destroy squamous cell carcinoma and possibly all histologic types of cancers of the lung.

LATEST TREATMENT PLAN

We have now decided on a different approach to the treatment of bronchogenic carcinoma even though 2 of the original 19 patients treated by supervoltage radiation alone between January 1, 1950, and February 27, 1952, are living and show no evidence of malignant disease. One of these has a residual radiation pneumonitis and the other is asymptomatic. It was decided to treat some of the patients who had previous surgical resections

TABLE 2
CARCINOMA OF THE LUNG
SURVIVAL AFTER TREATMENT WITH 2 MEV X-RAYS

Case	0-6 mos.	6-12 mos.	12-18 mos.	18-24 mos.	24-30 mos.
1	L	D			
2	L	D			
3	L	L	L	D	
4	L	L	L	L	L
5	D				
6	L	L	L	L	
7	L	L	L	D	
8	D				
9	L	L	L	L	
10	D				
11	L	D			
12	L	D			
13	D				
14	D				
15	L	D			
16	D				
17	L	L	L	D	
18	D				
19	L	D			
20	L	L	L	L	L
21	L	L			
22	L	L	L	L	L
23*	L	D			
24*	D				
25*	D				
26*	D				
	26	16	8	8	3
	16L	9L	8L	5L	3L
	10D	7D		3D	

*Not primary carcinoma of lung at autopsy.

with 2 mev radiation to the resected region including the mediastinum and supraclavicular areas. Included in the original 26 cases were 3 patients who had received radiation treatment postoperatively and have been followed for a year or more and are free of disease (table 2). The preferred plan, however, is to deliver to all of the probably invaded region a preoperative radiation dose as close to 6,000 r as possible. Subsequent surgical removal, if indicated, would permit a histologic study of the effect of radiation and avoid the occasional complications due to radiation effects. In other cases, the plan was to give a certain dosage of x-rays (about 3,000 r tumor dose), then remove the lung surgically making a histologic study of the lesions removed, and continue on to what we believed might be tumorcidal dose for cancer of the lung.

This latter plan would present an almost ideal form of treatment because it would make operable many of the questionable or borderline operable cases and it would allow us to determine the effect of radiation on tumor tissue. The patients who received radiation followed by surgery and then further radiation were treated too recently to draw conclusions concerning symptomatology and longevity and these cases are not included in this series. No surgical difficulties have been encountered as the result of 4,000 r to the

tumor, and further experience is desirable on the best value for this postoperative dose and the optimum time to surgery.

PHYSICAL FACTORS

THE RADIATION treatment technic almost invariably utilized fields of special shape as illustrated in figures 1 and 2, the beam being directed from anterior and posterior aspects on alternate treatment days. These fields are shaped for each patient to include the regions in which treatment is desired and are blocked out to avoid radiation in unaffected regions. Filters are used to equalize the dose when substantial differences of body thickness are encountered. The target-to-mid-depth position was 125 cm., and the HVL of the radiation produced by a 2.0 mev Van de Graaff x-ray source was 12.5 mm. of copper. The x-ray dose distribution produced along a line through the mediastinum by the opposing portal technic is nearly uniform; for a 25 cm. thickness the maximum dose is found 4 mm. under either skin and is about 118 per cent of the tumor dose at the midplane.

Figure 2 shows a radiograph taken of a patient with the 2.0 mev treatment beam, the double exposure showing the actual treatment port superimposed on a broad x-ray field. This method of verifying the accuracy of the treatment position disclosed the often superior diagnostic value of supervoltage radiation, particularly in regions such as the lung, mediastinum, and head and neck, which include air passages and widely varying tissue thicknesses. The weak bone shadows are the natural result of the relative absence in this supervoltage x-ray region of photoelectric absorption which dominates at conventional diagnostic voltages and which is strongly dependent on atomic number.

CONCLUSIONS

FROM our studies it appears that supervoltage radiation offers the possibility of a more successful approach to the treatment of some of the carcinomas of the lung. While radiation alone to the involved regions carried to doses of 6,000 r in thirty-five treatment days appears to have controlled advanced disease in isolated cases, the combination of gamma radiation and surgery may have advantages. Histologic studies, on this limited series of patients, indicate that we may have closely approached an adequate tumor dose and that there has been no difficulty with spread of the disease to lymph nodes in the fields treated with this quantity of radiation.

The support of the Massachusetts Institute of Technology portion of this program by the American Cancer Society and the U. S. Public Health Service is gratefully acknowledged.

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Personality Reactions to ACTH and Related Substance

Paul A. Draper, M.D.

THE APPLICABILITY of this subject to geriatrics is pertinent because the period of senility is one of man's physiologic epochs wherein he is particularly prone to develop mental disorder. His normally lowered resistance to stress of various kinds is apt to make the elderly especially vulnerable when subjected to the internal stress which has been found to be induced by ACTH, cortisone, and similar products. It would, therefore, seem wise for the practitioner to be extremely cautious and on the alert for psychologic disturbances when administering these substances to his geriatric patients.

The clinical use of ACTH and adrenal corticoids has been accompanied by numerous psychologic effects. These range from simple mood disturbances, such as euphoria or depression, through the range of psychoneurotic phenomena with disturbance of thinking and behavior, to occasional major psychotic reactions.[1] The variability of these responses makes it unlikely that they are due exclusively to pharmacologic toxic effects of these powerful drugs.[2] The widespread metabolic-physiologic changes which they induce are extremely interesting, and we are much indebted to such workers as Pincus and Hoagland and their associates at the Worcester Foundation for Experimental Biology for their contributions in this field.[3] A few of such alterations described include those in acid-base balance, electrolyte and water metabolism, carbohydrate, protein and fat metabolism, enzyme kinetics, reticuloendothelial function, alterations in nervous excitability, and interference with acetylcholine metabolism.

At least 15 adrenal cortical hormones have been found to be released into the blood stream in response to ACTH.[4] Their far-reaching metabolic repercussion in the body includes probably modifications in brain physiology.[5] Electroencephalograms of patients taking ACTH or cortisone have shown a reduction in amplitude with bursts of slow activity of the electrocortical potentials.[6] There seems to be a correlation between some of these metabolic-physiologic variations and the psychiatric reactions observed.[7] This leads to speculations in the realm of what might be called psychochemistry. This relationship would seem to be substantiated in those cases where the mental condition clears soon after the withdrawal of the administered hormone.

PAUL A. DRAPER, *a 1925 graduate of Indiana University School of Medicine, is assistant professor of psychiatry at the Colorado Psychopathic Hospital and the University of Colorado School of Medicine in Denver, and is consulting neuropsychiatrist at the Emory John Brady Hospital and Union Printers Home in Colorado Springs.*

However, some psychologic reactions are paradoxical to the gross physical improvements noted, or may presage them. Furthermore, we must remember that most of the patients taking ACTH or related substances do not develop a significant personality change along with their altered physical functions. Then too, in the case of those who do show personality changes, their general nonspecificity in relation to physiologic factors is strongly suggestive that these are simply precipitating stresses. They would then produce their effects by acting on or through predisposing psychologic determinants, which are either pre-existent or concomitant. The latter are sometimes colored by somatopsychic symptoms of the disease which is being treated, and also by the patient's emotional attitude toward his disease.

One of the most simple and also most prevalent psychologic factors paving the way for mood elevation and a general sense of well-being has to do with the satisfaction of being treated.[1] Considerable tension may be relieved, depending on the degree of gratification of this need. Eventual treatment of a previously refractory condition with extensively advertised "wonder drugs" gives rise to what might be termed a "eureka complex." The same mechanism, however, accounts for a subjective lift through placebos or quackery.

A further development in such a patient receiving these preparations may be his feeling of dependence on them. Next may come an apprehension of being let down or helpless again, on eventual withdrawal of the elation-producing effects of these drugs.[9] Realization of this danger of addiction leads to fear and then depression, in contrast to an original stimulating euphoria. This state of affairs is augmented when the patient happens to be one of those in whom ACTH or a related substance fails to achieve a therapeutic success. The patient then experiences psychic trauma from hopeless frustration of his expectations.

In other cases, the rapidity or magnitude of clinical improvement seems to find some individuals unprepared for smooth adaptation.[10] An additional stress is thereby added for those who would adjust better if a longer period of time was forthcoming in the healing processes. Some can't take sudden success here any more than others can in other realms of experience. This phenomenon is perhaps outstanding in those who, either from conscious or unconscious factors, sense the loss of secondary psychologic gains which they have previously developed in connection with a chronic illness.

The major psychotic reactions are typically found in those who had premorbid personality trends prior to receiving ACTH or cortico-steroids. The lid of repression is then lifted, so that marginal psychologic adjustments of the past are then expressed in an intensified, uninhibited pattern. The clinical form which the response takes is determined in large part by the patient's characterologic background, especially the manner in which he has previously responded to stress.[10] There is often a history of a definite previous psychiatric illness, although not necessarily a psychotic one. In any event, psychologic conflicts, previously latent, now become exacerbated and fulminant after

administration of ACTH or adrenal corticoids—cortisone particularly. The individual's defenses are temporarily weakened, which results in dramatic changes in his dreams as well as in his conscious productions.[1]

As examples of reaction types encountered, and of the role and interaction of physiologic and psychologic factors, the following cases are cited:

CASE REPORTS

Case 1. A 42-year-old white married woman had for years been a very meticulous and perfectionistic person. Her first marriage ended in divorce. One of her two children by her second marriage was institutionalized for mental deficiency. For the past year she had developed symptoms of multiple arthritis. Previous tendency toward mood swings became prominent and were primarily of a depressive type. She also had some unverified ideas that her sister talked about her. In a general hospital, she was given a total of 210 mg. of ACTH over a period of nine days, with some improvement in her joint pains. She was sent home where she received 40 mg. of ACTH daily. After 5 days there, she developed a fever of 105°. She was rehospitalized and the ACTH was stopped. She felt quite weak, but the temperature came down to 100°. The ACTH was then renewed for a few days, only to be stopped again when the fever persisted and the patient showed confusion. No ACTH was subsequently given, but the patient developed a persistent leukopenia and axillary lymphadenopathy. During the next six weeks, she was depressed, cried frequently, and talked strangely about pregnancy and religion.

The patient was admitted to Colorado Psychopathic Hospital on September 17, 1950, where she was quite disoriented. Her speech was illogical and flighty, and she was preoccupied with ideas of pregnancy. Her facial expression varied from mild depression to apathy to moderate elation and was not always appropriate to the situation. Judgment was impaired, and insight was lacking. She ran an intermittent fever up to 103° during her entire hospital stay and she showed heat, tenderness, and swelling chiefly in her shoulders, hands, and spine. There was a persistent anemia, with her hemoglobin varying from 9.1 to 10.65 gm. and her red blood cells from 2,530,000 to 4,400,000. A leukopenia ranged from 2,200 to 3,600. Numerous diagnostic studies, including blood examinations, marrow smears, lymph node biopsy, skull stereo roentgenograms, electroencephalography, and electrocardiography did not reveal evidence to warrant any other diagnosis than rheumatoid arthritis. Electroencephalograms during and after ACTH therapy showed paroxysms of slow waves, but these were not deemed definitely abnormal. After two weeks of conservative management, the initial toxic symptoms were disappearing. After that, however, she frequently showed a moderate degree of depression over the recurrence of her arthritic symptoms and their failure to be helped by ACTH. On November 27, 1950, she was transferred to the medical service of Colorado General Hospital for a general build-up regime with transfusions, high protein diet, and symptomatic management of her arthritis.

This patient's psychopathy had its roots in obsessive-compulsive traits followed by a symptomatic and reactive depression over the incapacitation induced by her multiple arthritis. Taking 410 mg. of ACTH in fourteen days was followed by some improvement of her joint symptoms, but the patient then ran a high fever. This abated somewhat when the drug was stopped, but the patient then manifested a delirium complicated by a depression which persisted when the sensorium cleared.

Case 2. A 40-year-old white married woman felt tired and had not menstruated since the birth of her second daughter nine years previously. A severe hemorrhage followed the birth of that child. For three years prior to admission to Colorado Psychopathic Hospital on July 29, 1947, there had been anorexia and recurrent spells of nausea, vomiting, and diarrhea, lasting two to three days at a time. Her asthenia became progressively worse during the preceding six months. Her family physician noted anemia and low blood pressure. The patient began to display mental symptoms of confusion and rambling, incoherent, illogical conversation. We should note that these initial mental symptoms were apparently without neurotic determinants and were attributable to her basic medical condition, which was diagnosed Addison's disease. Her blood pressure on admission was

84/60, all deep reflexes were hypoactive, she was extremely weak, showed some nystagmus, and spoke slowly with a nasal twang and considerable slurring. A fasting blood sugar was 60, and plasma chlorides 463 mg. per cent. Basal metabolic rate was minus 32. There was a tendency toward slight dysphagia. The patient was moderately depressed and complained of a faulty memory. Her case was considered to be primarily medical and only minimally and secondarily psychiatric. She was given only supportive treatment at first, but received 85 cc. of Eschatin by vein and intramuscularly a week later when she became much weaker. August 6, 1947, she was transferred to Colorado General Hospital for further treatment and work-up. Subsequently her condition was followed as an outpatient of the Medical Service and also during seven readmissions to Colorado General Hospital. She frequently received desoxycorticosterone acetate by intramuscular injection; and in September, 1950, DOCA pellets were implanted subcutaneously. On October 24, 1950, cortisone was started. She was given 25 mg. intramuscularly 3 times weekly, along with 0.5 gm. of sodium chloride daily. By Christmas of 1950, she developed auditory hallucinations and paranoid delusions. She claimed to hear voices plotting her death, to feel burning sensations from electrical appliances operated by her supposed enemies, and she believed that her husband was attempting to do away with her. These symptoms persisted until her readmission to Colorado Psychopathic Hospital on July 24, 1951. She had run out of cortisone five days previously. At first, she thought that the nurses and doctors were planning her death. The "voices" were very real to her, but her sensorium was clear. Her mood was one of depression mixed with indifference and lethargy. She soon had some insight into the fact that she might have been mentally sick. She was listless, weak, tired, and had myxedematous-like facies. There was no hyperpigmentation; the extremities and axillae were hairless, and there was only slight pubic hair. Her skin was dry and had a sallow, waxy appearance. Blood pressure was 108/68. Neurologic examination was essentially normal. Cortisone was not given. The patient responded well to increased doses of DOCA, intravenous saline, and oral salt. She appeared to benefit by interviews in which she expressed considerable resentment toward her husband and his attitude toward her affliction. She improved rapidly, physically and mentally, but her weight had decreased from 117 to 107 lbs. when she was discharged on August 5, 1951. At home she continued on 3 mg. of DOCA daily and 3 gm. of NaCl daily.

Prior to her third admission to Colorado Psychopathic Hospital on September 9, 1952, she had again taken cortisone for four days. She quickly developed vomiting, stomach cramps, augmented weakness, nervous tension, paranoid delusions, and auditory hallucinations. She was also despondent and had suicidal thoughts. The cortisone was stopped at once. The patient was apprehensive at re-entering the hospital, but she said that cortisone had again thrown her off balance mentally. She cried when subjects of her health or her relations with her husband were discussed. While she had no hallucinations or feelings of unreality this time, she did feel that her husband had placed her in the hospital so that he could step out with another woman. Patient added that he did not provide adequate financial support for her or her children. Her sensorium was intact, and she had a fair amount of insight. Her multiple somatic hypochondriac complaints were possibly somewhat exaggerated and influenced by her emotional state. She was not considered to be psychotic after the first day of this hospitalization. A roentgen film of the abdomen showed probable adrenal calcifications, bilaterally. She improved rapidly under mild sedation and symptomatic measures and was transferred back to the medical service on September 18, 1952.

This patient originally showed mild sensorial disturbances on the basis of a near-crisis of Addison's disease. Twice thereafter she developed a paranoid psychotic break which corresponded with the taking of cortisone, and subsided when the drug was withdrawn. The content of her reactions was colored by her attitude toward her disease. She felt that she was losing the affection of her husband because of her affliction, and so she developed a feeling of hostility toward him. The final diagnoses were panhypopituitarism with secondary Addison's disease, hypothyroidism with secondary anemia, and psychoneurosis, anxiety type.

Case 3. A 54-year-old professional man entered the Brady Hospital in Colorado Springs, on May 31, 1947, showing symptoms of hypomania complicated by alcoholism and the effects of a recent accident. He received many bruises over the entire body, but apparently there had been no brain concussion, and skull roentgenograms were negative. His manic state improved a great deal after three electro-convulsive shock treatments,

but it was noted that he continued to have some expansive ideas when he was released to the care of two brothers on July 11, 1947. During the next three years, it was noticed by friends that he would occasionally make surprising remarks which really indicated delusions of grandeur. He spoke of his great wealth in figures many times over his actual resources.

This patient re-entered Brady Hospital on December 7, 1950, during another phase of mania and alcoholic intoxication. One month previously, he had shown restlessness and was doing a lot of bragging during some rather heavy drinking. Three weeks before admission, he developed bronchopneumonia, for which he was given penicillin. On November 11, 1950, he had a major convulsion, during which he fell and struck his head. He had three more convulsions that same day. A few days later when his wife died after a chronic neurotic invalidism, he was reported to be taking Nembutal capsules rather freely. The patient's reactive depression from that led him to indulge even more heavily in drinking. A spinal tap which I had done at another hospital on December 2, 1950, showed a xanthochromic fluid under an initial pressure of 200 mm. of fluid, total protein 48 mg. per cent, cell count 3, Kahn negative, and colloidal gold curve all zeroes. The blood Kahn was likewise negative. On my advice, the patient took 1½ gr. of Dilantin three times a day from November 29 to December 7. I then stopped this as somewhat of a trial measure to see what would happen. My idea was that if his convulsive disorder should recur, I would consider this a contraindication to the use of electro-convulsive therapy for this new manic episode. On December 10, the patient did have another major convulsion. The Dilantin was resumed and the electro-convulsive technic was not used. He developed some coarse tremors and auditory hallucinations which I decided were warning signals of delirium tremens and should be abated as soon as possible, since we knew that we had a basic mania and residuals of a brain concussion to deal with, even if the alcoholism were brought under control. Therefore,[11] on December 12, 1950, this man was started on adrenocortical extract in the form of Lipo-Adrenal Extract. He received 3 cc. intramuscularly the first day, 2 cc. the second day, then 1 cc. per day for five days, and finally 1 cc. twice weekly until January 1, 1951, by which time the patient had been given a total of 14 cc. of this potent substance. It was then discontinued because for three days he had shown an unexpected different reaction: indifference, relative quiet, curled up in bed and was somewhat rigid, urinary incontinence, and bowel retention. If an upper extremity were passively placed in some peculiar position, the patient left it there for several minutes. He resisted doing everything he was asked to do except that he was persuaded to take food and fluids fairly satisfactorily. We considered the possible development of a subdural hematoma, but it was soon evident that the patient was exhibiting catatonia, as manifested by stupor, negativism, and muscular rigidity. A spinal puncture on January 2, 1951, with the patient lying on his side, showed an initial pressure of 280 mm. of fluid, which was slightly xanthochromic, contained no cells, contained 54 mg. per cent of total protein, and was otherwise negative. His catatonic features gradually cleared by January 12, 1951, or two weeks after their appearance, and eleven days after the Lipo-Adrenal Extract was stopped.

These catatonic manifestations never recurred. During the next eight months, with psychotherapy and controlled sedation, the patient alternately showed manic flares, some episodes of mild depression, some paranoid tendencies, and definite ideas of grandiosity. An electroencephalogram on July 26, 1951, showed suggestive evidence of organic brain disease as did a battery of psychologic tests. The latter gave no suggestion of a basic schizophrenia. He was released to the convalescent management of a Veterans' Administration Hospital on August 15, 1951.

This man's symptom complex was a mixture of manic depressive cycles, alcoholic addiction with probable alcoholic encephalopathy, and brain concussion with some likely post-traumatic meningo-encephalopathy. In view of these pre-existing personality deviations, there was fertile soil for the development of additional psychopathy with the use of adrenal cortical steroids, and this is precisely what happened. We took this gamble and lost, in our efforts to prevent the occurrence of a full-blown delirium tremens. The latter did not materialize, but was replaced by two weeks of catatonia.

Citation of other cases handled by some of my colleagues includes one patient with a manic psychosis and another with a psychotic depression,[12] both appearing during the administration of ACTH and clearing soon after the withdrawal of the drug. Another was a chronic alcoholic male who developed rheumatoid arthritis which was temporarily

relieved by cortisone, only to have a "moon face" and a profound depression appear.[13] When the cortisone was then withdrawn, the patient's depression deepened with his frustration over the return of his arthritic condition. He then resorted to large amounts of Nembutal, from which a delirious state appeared.

COMMENT

Some relationship between adrenal cortex dysfunction and mental disease does seem to exist. Rather than this being a cause and effect connection, however, it may be that they are both produced by a common factor.[14] The painstaking biochemical discovery of one adrenal cortical hormone after another being released in response to corticotropin emphasizes the dominal role of the anterior pituitary. The occasional prolonged psychologic disturbance seen after the withdrawal of ACTH or cortisone therapy[15] may conceivably be due to iatrogenic insufficiency of the anterior pituitary or adrenal cortex, associated with their induced atrophy.[16] On the other hand, it has been shown that bilateral adrenalectomy can be done in man with comparative safety of higher brain functions, provided that maintenance replacement therapy is then used.[17]

The clinical similarity between delirium tremens and addisonian crisis led Smith of Bellevue to suggest that both are due to an adaptation syndrome, on the basis of repeated stresses. He then presented the hypothesis that alcoholism is based primaily on pituitary insufficiency and that adrenocortical and gonadal hypofunction are secondary phenomena. Other workers have confirmed his therapeutic results with ACTH and adrenal cortex extracts in speeding up the recovery in a variety of acute alcoholic conditions.[18] There is no convincing evidence, however, that the chronic alcoholic addiction is thereby relieved.

In diseases of the nervous system, neurologic disorders of an allergic nature are most apt to be helped by these drugs. In already well-established psychiatric disorders, most reports indicate only slight and temporary benefit from ACTH or cortisone.[19] The various studies with these hormones nevertheless have been helpful in removing some of the obscurity of previously unknown or unrecognized organic components of psychiatric disorders. We are getting some further knowledge of the mechanisms of insulin shock and electro-convulsive shock by measuring the adrenal gluco-corticoids, chiefly the 11- and 17-oxysteroids and the associated eosinopenia and lymphocytopenia. Insulin hypoglycemia, for example, causes an outpouring of epinephrine, which is effective in activating the anterior pituitary and the adrenal cortex,[20] as shown by these tests.

Thus the profound physiologic changes produced by ACTH and related substances have served to point up the symbiosis of the nervous system with all other bodily systems, particularly the glands of internal secretion. As further discoveries are made, endocrinology and psychiatry will become further coordinated in our efforts at understanding body-mind unity.

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IT IS TRUE that in some social mammals, notably among ruminants and Primates, an old male or old female is frequently found as leader of the herd. Such cases, however, provide the only examples of the special biological utility of post-mature individuals among animals; they are confined to a very small proportion of the population, and it is uncertain to what exent such individuals are post-mature in the sense we have defined. In any event, it is improbable that the period of post-maturity is anywhere near so long as that of maturity. But in civilized man the average expectation of life now includes over ten post-mature years, and about a sixth of the population enjoys a longer post-maturity than maturity. What is more, in all advanced human societies a large proportion of the leaders of the community are always post-mature. All members of the British War Cabinet are post-mature.

JULIAN S. HUXLEY, *The Uniqueness of Man*

EDITORIAL

Geriatrics 100 Years Ago

WE PHYSICIANS keep thinking of geriatrics as a new problem. It was interesting, therefore, to see in an article by Dr. John Lister of London, England, in the *New England Journal of Medicine* for May 28, 1953, that a century ago the British Parliament was discussing the problem of caring for the increasing numbers of old people. At that time only 5 per cent of people in England were over 65 and for every such old person there were some 30 of working age. Today, with over 5,000,000 in the group of the aged, there are only 6 persons among the workers able to care for them.

A century ago a motion was carried in Parliament asking that the government do more for the aged sick. Incidentally, at the time the Prime Minister was a hale and hearty man of 78. The complaint was then made, as it must be made today, that too many hospital beds, which should be reserved for the treatment of persons with acute illness, were being occupied by old people suffering from mental and physical deterioration.

The Ministry of Health brushed the whole matter off, saying that the majority of people preferred to be cared for at home. In other words, more hospitals were not needed.

WALTER C. ALVAREZ, M.D.

Cowdry's "Problems of Aging"

THIS comprehensive work first appeared in 1939, when some thoughtful men were beginning to realize that with a changing population more attention would soon have to be paid to the problems of aging and diseases of the old. Dr. Cowdry amassed information from many pathologists and experimenters.

A third edition recently appeared under the editorship of Dr. A. I. Lansing. Chapters on aging in plants and various animals are replaced by some on the aging processes in man. In the first edition, Dr. Clark Wissler had a chapter on aging in a number of human groups, and Dr. W. R. Miles wrote on some psychologic aspects of aging. The recent edition contains more practical chapters, such as Dr. R. Elman's discussion of surgical problems in the aged and Dr. E. Apogi's chapter on anesthesia. Dr. H. Rusk and Dr. E. J. Taylor discuss rehabilitation of the chronically ill, and Dr. M. Chieffi writes on the cosmetologic aspects of aging.

The first section is entitled "Biological and Cellular Problems of Aging." Here Dr. Lansing deals with his studies on aging rotifers, and Dr. Cowdry discusses aging of tissue fluids and individual cells. The second section is concerned with clinical and organic problems and aging in the several organs and organ systems. The third section deals with social and economic problems and problems of employment.

WALTER C. ALVAREZ, M.D.

SOCIOMEDICAL PROGRESS

Devoted to constructive correlation of sociological and medical problems of the aging . . .

Earning Opportunities for Mature Workers

REPORT OF MICHIGAN CONFERENCE

Wayne R. Davidson

EARNING OPPORTUNITIES for mature workers was the topic discussed at the sixth annual conference on aging held July 8 to 10 at the University of Michigan. This year's conference was again under the direction of Dr. Wilma Donahue, chairman of the division on gerontology of the University's Institute of Human Adjustment. A special feature of the conference was a senior citizens' day program which included participation by a large number of older adults from neighboring communities. Among those who participated in the conference was Mrs. Oveta Culp Hobby, secretary of the United States Department of Health, Education and Welfare.

Reports on current efforts to increase the use of older adults in the labor force were encouraging; yet the over-all statistics indicate that the earning capacities of all such persons are far from being utilized.

The following are some of the conditions which have contributed to reducing the proportion of older persons in the labor force:

1. An increase in the proportion of aged persons in the population without a corresponding increase in employment opportunities for such persons;
2. The fact that older women, who have even greater difficulty than older men in securing employment, may be expected to increasingly outnumber older men in our population;
3. The fact that a growing majority of our older adults live in cities where employment opportunities for such persons are more limited;
4. Changes in the industrial pattern under which there is less need for the older worker.

SINCE 1900 there has been a declining labor force participation of men 55 and over, and especially those past 65. While there has been an increased participation of women in the labor force (except for those past 65) the increased employment of women 45 to 64 years of age has not made up for the declining proportion of older men em-

WAYNE R. DAVIDSON *is director of the Los Angeles County Committee on Opportunities and Needs of the Aging, Los Angeles, California.*

ployed or in the market for employment. As evidence that wartime conditions only served to temporarily modify this trend is the fact that the proportion of men 65 or over in the labor force declined from 51 per cent in April, 1945, to 42 per cent in April, 1952.

One indelible impression carried away from the conference is the fact that the task of developing earning opportunities for older adults is exceedingly complicated. The question of why more older adults are not employed received a variety of answers. Such reports, furthermore, suggest that the real reason is a prejudiced attitude toward the older person rather than the answers given. There was also the frequently reiterated plea that even if there were valid reasons for not employing older persons as a group, there are certainly many individuals capable of competing on equal terms with younger workers; and that it is the task of industry to develop methods of sorting out such persons so that they might be utilized. And still beyond this is the problem of utilizing in some manner the productive capacities of those who no longer can work under competitive conditions. All of this has to be done within the framework of our existing economy.

The employer has to consider many factors other than productivity alone in determining the feasibility of hiring the older worker. He has to consider the effect of the hiring of older persons upon employee relations within his own organization, upon his bargaining position with labor unions, upon the availability of promotional opportunities sufficient to attract capable new personnel, upon his workmen's compensation rates, and upon pensions, health insurance, and other employee benefit costs. He has to consider these factors both in terms of present and future needs. Ultimately, no matter how sympathetic he might be to hiring older persons he has to gear his actions to costs, so that his competitive position in industry will not be jeopardized.

Doubtless many employers are reluctant to hire older persons, yet reasons given differ. There is the belief that productivity would be reduced as the result of a decline in strength, speed of movements, dexterity, coordination, visual and auditory acuity, stamina, mental alertness, and learning capacity of the older adult. It is believed he is more susceptible to illnesses, which would decrease his efficiency still more. A considerable number of employers believe that the older person's usefulness might be impaired by his inability to accommodate to group situations, by an inflexible and authoritative attitude, and by a negative and unimaginative approach to his job. The loss of physical attractiveness in the older person is a problem to some employers, especially where the job has a public relations aspect. The employment of a large number of older persons, it was believed, interferes with career service and sometimes prevents promotions being given to promising young persons.

THE EXPERIENCES of some employers seem to indicate that the deficiencies of the older worker have been exaggerated and that a strong case can be made for the older worker despite his declining capacities. Although the older adult suffers some decline in his capacities, there are compensating factors which more than make up for these deficiencies. It was agreed that the older worker is more dependable, stable, and has greater job interest; therefore he has less absenteeism, wastes less time on the job, and in general is more likely to protect the interests of the employer. Accident statistics do not bear out the contention that he is more prone to accidents, therefore, there is no reason why the employment of such persons should increase workmen's compensation costs. The older worker has an accumulation of work experience, skill, and wisdom which the younger worker would require years to acquire. Moreover, it was believed that the need for maximum

physical capacities on the job has been exaggerated. Even on jobs where the employee has no control over the work pace there is usually sufficient tolerance to accommodate many older persons. While the older person may be more prone to illness he is not so ready to use such illness as a reason for absence. Disabling illnesses which impair finger dexterity or the free movement of the arms or legs probably are the greatest handicap to the older worker. It has been established that older persons are capable of learning new processes although the training time may be somewhat longer. While the older worker may lose his youthful appearance, he may have even greater public relations value because of his diplomatic skill and the greater confidence the public would have in his mature judgment. Promotions should be on the basis of merit, but most business concerns, even if they employ older persons, should have sufficient openings to take care of the promotional needs of their future executives. Admittedly, pension and health benefit programs present a problem, but the increase in costs when older persons are hired is usually exaggerated, and there are methods available to the employer for absorbing such costs. In any case, under present federal income tax laws, pension and health benefit payments are an acceptable expense deduction, provided the program meets the requirements of the Bureau of Internal Revenue. If the older worker has a negative attitude toward his job because of low morale, this negativism can often be cured by giving recognition to his good points. Advocates for the older person contend that traits of inflexibility and other undesirable attitudes of some individual older persons are wrongly attributed to all older persons.

The problem in the placement of the older worker seems to be twofold: (a) persuading the employer to consider the applicant on his merits, and (b) inducing the employee to make the best use of his assets. Arbitrary age limits on entrance employment are fairly common, either as a set policy or as a matter of practice. While it may be difficult to get a general policy changed, it is frequently possible to get a variance for a specific individual, especially with a smaller concern. One of the problems in getting fair consideration of the older applicant is the fact that personnel officials are usually young themselves, and often have prejudiced attitudes regarding older adults. The chief problem of the older applicant is his own attitude. He is likely to approach the prospective employer in a negative manner, failing to present adequately his best assets, and appearing to be seeking understanding and sympathy. Women who have no working experience, or who have been out of the labor market for many years, are handicapped by their lack of knowledge of the business environment and its requirements.

It was estimated that at least one older applicant in three needs counseling service. Such services are not now available in most communities due to budget limitations of the public employment service and the lack of private resources. One employer stated that his company tried to give older applicants who were rejected as much help as possible in solving their unemployment problems. Skilled counseling should provide the older applicant with a sympathetic hearing, assistance in evaluating his strengths and limitations realistically, and information regarding possible employment opportunities. If retraining is required, the person selected should be otherwise placeable. Where possible his previous experience should be utilized rather than attempting to train the older worker in an entirely new field. Caution should be used in selecting persons for training on the basis of tests, as many tests now in existence tend to be discriminatory against the older person. Technical training, it was believed, should be accompanied by counseling on how to apply, how to behave on the job, and what the employer expects of the employee.

Reports of successful experiments in promoting earning opportunities for older adults were impressive and served as tangible evidence that any community, if it so willed, could increase the earning opportunities of its senior citizens. Established industries with a labor shortage, for example, might profit by the experiences of a Wisconsin bank which was able to meet its personnel needs by employing part-time workers, many of them housewives who had had no recent working experience.

New services organized specifically with the idea of utilizing the earning capacities of older workers included a furniture factory in Florida which employed retired craftsmen on part-time basis; a group of retired draftsmen in Schenectady, New York, that incorporated and did subcontract work for their former employers and other industrial concerns; an outlet shop in Syracuse, New York, where home-produced merchandise was sold; a women's service group in Madison, Wisconsin, which organized, in conjunction with the public vocational school, a placement service for part-time workers; and a job counseling and training service carried out by a training school and social agency in New York.

The older adults at the conference on senior citizens' day were especially interested in the series of workshops designed primarily to help the self-employed. There were workshops on starting a small retail business, craft production, operating a small farm, starting a small manufacturing business, and marketing personal service and home products. In these panels emphasis was placed on the importance of following sound business practices.

Retirement procedures, while not the major topic of this conference, received consideration. Many employers are apparently experimenting with some type of pre-retirement training program. There was some evidence that employers were uncertain as to the effect of retirement on their employees and desired more data of this character. The view was generally held that a fixed compulsory retirement age was outmoded. One speaker, however, who had had extensive experience with a large retail merchandising agency voiced the opinion that a definite compulsory retirement age for executives is needed to assure the continued vigor of an organization.

Communities were urged by another speaker to use the methods followed by the Committee on Economic Development to provide employment opportunities for older adults. This committee with only a small staff was responsible for the development of countless numbers of jobs through the organization of over 2500 local committees.

Recognition was given to the importance of the psychological benefits which accrue from work. This viewpoint was best expressed in the following quotation from an address given by Dr. Martin Gumpert:

> . . . To the older person time becomes the most precious substance on earth because time—as he realizes—is running out; time is furthermore slowing down, he can do less and less with a certain space of time, and his need for rest between working hours grows because his reserve energies are increasingly exhausted. The result is often hurry instead of leisure. At this point of life every older person should know that his health, and, more or less, his continuation of mental and physical existence depend on work. Work is the miracle drug for the aged.

It is noteworthy that this conference was participated in by organizations from every section of our nation. Because of the caliber of the panel participants and the broad audience to which these deliberations appealed this was a national conference in every sense of the word. It is evident that this series of conferences sponsored by the University of Michigan fulfill a nationwide need in bringing together annually leaders engaged in this pioneer field. Conference participants, therefore, welcomed the concluding remarks of Dr. Donahue announcing that the University had every intention of continuing this series.

DIGESTS *from Current Literature*

Suxamethonium-Modified Electroconvulsive Therapy in the Frail and Elderly.

G. I. TEWFIK, M.D., *Lancet* 265:110-112, 1953.

An exceptionally strong relaxant with very brief effect, suxamethonium chloride, makes electroconvulsive therapy safe for most old people, even those critically ill or violently insane.

Ages of 61 persons treated averaged 68 years and ranged up to 85. Recovery or improvement resulted in 40 of 42 cases with depression and also in manic, paraphrenic, or confused types. Like decamethonium, the drug depolarizes regions about the motor end-plates.

Half an hour before treatment, 1/100 gr. of atropine is given. The subject is placed on a bed and put to sleep with 0.175 to 0.3 gm. of thiopentone injected very slowly by vein.

From 25 to 35 mg. of relaxant is given intravenously, taking two seconds. If muscular twitching followed by paralysis does not result in five minutes, the dose is increased by 10 mg. The usual amount is 30 mg. and the largest 45 mg.

The patient is turned on his side, and the abdomen is uncovered so that onset of apnea may be noted. When breathing stops, artificial respiration is begun with oxygen inflation. After 8 breaths in thirty seconds, electrodes are placed on the head, and a convulsion is induced with stimulation for 0.8 to 1 second.

Overdosage may be counteracted by 10 to 22 cc. of intravenous nikethamide or perhaps by cholinesterase. Treatment is avoided, if possible, in cases complicated by fracture or operation during the preceding month, pulmonary infection, or angina and recent coronary thrombosis.

Estrogen-Androgen Substitution Therapy in the Aged Female: I. Uterine Bioassay Report.

MARVIN H. GRODY, M.D., ELFRED H. LAMPE, M.D., and WILLIAM H. MASTERS, M.D., *Obst. and Gynec.* 2:36-45, 1953.

Replacement therapy for menopausal symptoms is sometimes disapproved because estrogen causes endometrial hyperplasia, a possible forerunner of cancer.

Undesirable reactions can be neutralized by male hormone. If estrogen is combined with androgen in a ratio of 1 to 20, neither uterine bleeding nor hypertrophy results.

Actual response of tissues to different doses was studied in 11 subjects 64 to 89 years old. The average age was 76. Before combined treatment, ability of the uterus to react to estrogen was demonstrated by production of cyclic withdrawal bleeding.

The basic medication was 1 mg. of *a*-estradiol benzoate, the most effective amount for the menopause, injected intramuscularly in sesame oil twice a week. Testosterone propionate was given in the same 2-cc. syringe. Endometrial biopsy and vaginal smear were obtained at intervals.

During ten weeks of therapy with an estrogen-androgen ratio of 1:10, the female hormone remained dominant. Slight to moderate endometrial hyperplasia appeared in all cases, and vaginal spotting or slight blood flow occurred in 7.

When androgen was increased to 20 mg., the endometrium in 8 women became senile in three and a half weeks and in all others soon afterward. Tissue eventually became so fibrotic that only tiny bits could be scraped off.

In six months of combined therapy, vaginal smears displayed ill-defined cell borders, free nuclei, and a background of cellular debris. On vaginal examination, all viscera appeared senile and atrophic.

Studies on the Aging Heart.

HARVEY POLIAKOFF, M.D. and PAUL KAUFMAN, M.D., *Arch. Int. Med.* 91:767-772, 1953.

Heart disease is not an inevitable accompaniment of old age. Even after the age of 60, most anatomically normal hearts function normally too. Clinical, roentgenologic, and electrocardiographic methods of study, if critically appraised, usually give a fairly accurate differentiation between the normal and the abnormal heart in the aging person.

Of 800 consecutive autopsies analyzed of patients over 60 years of age, 5 per cent showed no gross evidence of coronary arteriosclerosis, myocardial fibrosis, myocardial hypertrophy, or other heart disease. The functional capacity was good in all 5 per cent of patients.

Systolic murmurs in themselves are not indicative of heart disease. Unipolar lead electrocardiograms on elderly patients without heart disease may show premature contractions, decreased voltage of P, QRS, and T waves, left axis shift, and prolonged QRS, P-R, and ST components.

Roentgenologic findings agree with the other findings. Most blood pressures were under 150/100 in this group. Hypertension of any degree is almost always associated with coronary sclerosis. Those patients who do not suffer from or die of heart disease, die

mostly of malignant neoplasms, cerebral accidents, or kidney ailments. Arteriosclerosis of other organs was found in a significant number of these patients.

Other clinical observations seen in persons with normally aging hearts are: dilated veins; increased venous pressure in the absence of heart failure; and faint heart sounds because of senile changes in the heart muscle. The second aortic sound is often accentuated in those with pronounced hypertension in the systemic circuit, and the pulmonic second sound is accentuated with pulmonary hypertension. Fever or emotional stress may make the first sound loud in the absence of mitral stenosis. The systolic murmurs are generally attributed to less accurate closing of the valves or to tortuousness and dilatation of the aorta. Calcified plaques in the aorta may produce a coarse systolic murmur.

The Differentiation and Management of Abnormal Mental States in the Aged.

Warren T. Brown, M.D., and Jackson A. Smith, M.D., *South. M. J.* 46:582-584, 1953.

The tendency to blame all changes in behavior of elderly persons on structural alterations of the central nervous system is not well founded. Emotional problems play as great a role in advanced years as they do in early years. Indeed the impact of these problems may be greater because the emotional difficulty is coupled with a realization of aging. The combination often results in symptoms, which are not irreversible, provided the basis for the emotional problem is understood.

Regardless of what pathologic change may develop in the structure of the aging person, as long as he is conscious and able to experience his environment, emotional factors arising from his situation in life will influence his behavior. Failure to recognize these factors tends toward neglect of therapeutic possibilities which can provide the patient more productive and happier years.

The physician caring for the aged patient with behavior problems must evaluate cautiously two interrelated factors. First, the degree of loss of capacity from the advancing pathologic changes of senility must be determined. Next, the element of emotional disturbance and its effect on the patient made vulnerable by senility should be determined. Individuals with average tendencies toward depression and anxiety may cross the borderline as they begin to age. Attention to a patient's emotional and situational needs is more strongly indicated when a deficit in capacity has resulted from senile changes.

Many common problems account for frustration in the aged with resultant emotional disturbances. Among these are: enforced retirement by fiat, with no consideration given to actual capacity to continue working; limited physical activity due to physiologic deficit; reduced sexual activity; loss of spouse; loss of responsibility; feeling of not being needed; loss of status in the community; and fear of being a burden.

A careful investigation into the personality of the patient in his younger, premorbid state is essential for intelligent management of these cases.

The treatment of emotional illnesses in aged people with or without structural deterioration involves both psychic and somatic approaches. First, careful attention is directed to the nutritional needs of the patient, supplying vitamin and protein therapy when required. Irritability and restlessness respond to appropriately selected sedatives. Mebaral is an excellent sedative for geriatric patients. Electroshock therapy may be indicated in those patients where a definite depressive illness has been diagnosed. In these cases, accuracy of diagnosis is important because electroshock seems to intensify symptoms resulting from structural senile changes of the central nervous system. Oral Metrazol has been found an effective adjunct in the aged.

The best management, however, is an understanding psychotherapeutic approach to the older patient which considers: (1) the basic personality of the patient; (2) the evaluated deficit resulting from age; (3) the situation in which the patient is living; and (4) his response to it.

Metrazol in Geriatrics.

Joseph O. Smigel, M.D., Lawrence A. Serhus, M.D., and Samuel Barmak, M.D., *J. M. Soc. New Jersey* 50:248-252, 1953.

The problem of loss of appetite in the aged becomes a serious one, especially in large institutions where menus cannot be individualized. The care of older people is further complicated by states of apathy, apprehension, disorientation, and fatigue so often displayed in such a group.

Metrazol proved beneficial in improving the appetites, blood picture, and general condition, in a group of 20 patients in a chronic disease sanatorium. Metrazol stimulates respiratory and circulatory centers and thus reduces anoxia, improves circulation, and increases the general well-being of the patient. The drug is stable, nontoxic and noncumulative. Absorption after oral or parenteral administration is good.

Metrazol is administered in a dose of 0.2 gm. four times a day. If no symptomatic improvement occurs after a month, the dose is increased to 0.3 gm. four times a day. Under such management, almost all patients show improved appetites. Hemoglobin, red cell count, and white cell count rise. Disorientation disappears. Patients who were incontinent before taking the drug frequently regain bowel and bladder control. Blood pressure,

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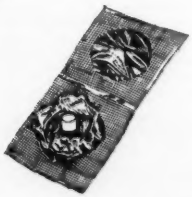

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especially in hypertensives, falls significantly. Many patients previously bedridden become ambulatory and able to care for their own needs. No deleterious effects were observed.

Physical Medicine and Rehabilitation as Applied to Geriatrics.

A. B. C. KNUDSON, M.D., *South. M. J.* 46:585-589, 1953.

Proper treatment of patients suffering from disabling disorders associated with aging results in partial or complete rehabilitation and in tremendous economic savings in a much higher proportion of cases than was previously supposed possible.

The problem is now a major one in the specialty of physical medicine and rehabilitation, since reports indicate that the proportion of persons over 65 years of age jumped from 4.1 to 6.8 per cent between 1900 and 1940 and is expected to double again by the end of the century.

Experience in Veterans Administration hospitals indicates that tremendous economic savings are possible in rehabilitating patients previously considered to be permanently and completely dependent.

A significant share of these favorable results is due to inauguration and operation of physical medicine and rehabilitation bed services, now totaling more than 1,400 beds in Veterans Administration hospitals. In one case, it is observed that less than 5 per cent of aged, chronically ill, and severely disabled veterans who have been rehabilitated and discharged present themselves at a later date for readmission.

One of the most extensive studies available on the operation of this service summarizes results in 105 cases followed at the Veterans Administration Center, Los Angeles. This group consists of men averaging 55 years of age with declining or nonexistent economic potentials, all physically disabled, many chronically ill, and many with long previous periods of hospitalization. Seventy-six of the group of 105 are considered rehabilitated, 34 being discharged to their homes and 42 to a domiciliary where they are able to perform self-care. An increase in percentage of ambulatory patients of 48.7 per cent and a decrease in percentage of semiambulatory patients of 30.3 per cent is noted.

The study also points out that the cost of caring for the group of 105 patients studied decreased to about one-fourth after an average length of treatment of 185 days. This accounts for an annual saving for this group of about $440,000.00, with an expenditure of only about $18,000 for those completing therapy.

These studies indicate that the frequent attitude of hopelessness on the part of the physician toward the aging disabled patient should be changed, and that attempts at rehabilitation should be vigorous, rather than passive. Such a course of action can also help avert the patient's psychological difficulties associated with aging and with the further insults of forced retirement and a feeling of uselessness.

The physical medicine and rehabilitation service of the Veterans Administration now has a major service in each of its hospitals and a medical unit in each regional office unit. Within the service there are five component sections devoted to physical therapy, corrective therapy, occupational therapy, educational therapy, and manual arts therapy. Experience since its institution following World War II indicates that this pattern is the most effective and is both a sound economic investment and a tremendous aid individually to the over 19 million veterans of this country.

Acute Obstruction of the Colon.

WALTER F. BECKER, M.D., *Surg., Gynec. and Obst.* 96:677-682, 1953.

Ill-advised treatment of acute colonic obstruction is causing many unnecessary deaths.

Nearly half of 205 cases reviewed were due to cancer and 25 per cent to volvulus. Patients over 60 years of age accounted for 51.5 per cent of the series and 61.5 per cent of fatalities.

Acute obstruction of the large bowel by cancer requires immediate surgical relief of distention in all cases. High mortality is chiefly due to delay in decompression, unwarranted abdominal exploration, and primary resection.

For tumor of the left colon, a simple loop, right transverse colostomy is preferred. If cancer develops in the distal ascending colon, hepatic flexure, or right half of the transverse colon, cecostomy is in order.

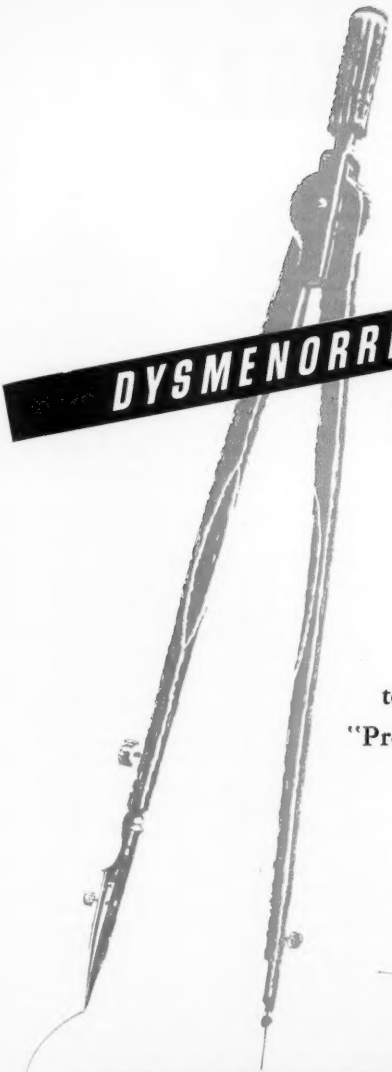
Cecal cancer necessitates ileotransverse colostomy, provided the ileocecal valve is incompetent, the ileum not greatly distended, and the general condition good.

If the valve is competent, the resultant closed-loop cecal obstruction is managed by complete division of the ileum and ileotransverse colostomy. A large catheter is inserted through the distal ileum into the distended cecum, and the distal ileal stump is brought out through the abdominal wall.

Sigmoid volvulus is generally corrected by emergency operative reduction followed in a few days by elective resection with end-to-end anastomosis. Irreversible strangulation demands an emergency exteriorization resection.

Volvulus of the transverse colon requires 2-stage reduction and resection.

After detorsion of cecal volvulus, the cecum should be fixed to the abdominal wall by routine cecostomy. If the cecum is already gangrenous, exteriorization is less risky than right colectomy and ileotransverse colostomy.



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GERIATRICS *Book Reviews*

Public Health Education, Its Tools and Procedures

H. E. Kleinschmidt, M.D., and Savel Zimand, 1953. New York: The Macmillan Company. 302 pages, $4.50.

This is a remarkable book which doubtless will be of great interest to many persons today, now that so many people are trying to educate the public in regard to health. For all of them, this book should be a vade mecum. It is full of information and is interestingly and well written.

WALTER C. ALVAREZ, M.D.

•

Diagnostic Tests in Neurology

Robert Wartenberg, M.D., 1953. Chicago: The Year Book Publishers, Inc. 228 pages, $4.50.

With all the current preoccupation with various technical and laboratory aids for the diagnosis of neurologic disorders, it is indeed a pleasure to read this well-written text emphasizing the importance of the clinical examination of the nervous system. The author's introduction is a classic and includes sage remarks about the applicability of laboratory procedures to neurologic diagnosis. He stresses the importance of avoiding routine use of these frequently superfluous tests since clinical examination is usually more fruitful and practical. His statements on "the power of observation" bear consideration.

The various aspects of the neurologic examination are presented with unique skill and described in a conversational manner with occasional allusions to personal experience. The author appropriately summarizes the contents of his book as follows:

"Of the diagnostic tests discussed here, some are new, some so new that they have not been mentioned in any neurologic Baedeker. Older, time-honored tests which have not found proper recognition are mentioned if they need special emphasis. The constant endeavor has been to make new things familiar, and familiar things new. Tests which not only have local significance but also colorfully illustrate some general physiologic principle of broader application are given their due.

"Definite, decisive, high-powered tests have been selected. However, to these proved tests have been added a few whose diagnostic significance and value have not as yet been fully established. But they are promising and worth trying. Tests which serve to uncover the inception of a disease, those which alert the examiner, have been particularly stressed.

"All tests described in this book are simple and can be easily performed in the office or at the bedside. None is time consuming, none will make the patient uncomfortable. They are proved tests, based not on bookish wisdom but on years of practice. Here there is no borrowed experience; only what I have seen with my own eyes is reported."

Although the book was written for the general practitioner, it would be appropriate for student use and the specialist would profit from a review of it as well.

A. B. BAKER, M.D.
Department of Neurology, University of Minnesota

•

Hypersplenism—A Clinical Evaluation

Cyrus C. Sturgis, M.D., Springfield, Illinois: Charles C Thomas.

This excellent monograph on hypersplenism serves the purpose of surveying, with critical evaluation, the present knowledge of hypersplenism. The structure and function of the spleen, effects of removal of the normal mammalian spleen, the effects of splenectomy on pregnancy as well as theories of causation are included.

Two types of hypersplenism have been recognized, the primary without obvious cause is thought to be inherited and includes hereditary spherocytosis, thrombocytopenic purpura, splenic neutropenia, and pancytopenia. The second group is classified as secondary hypersplenism associated with recognizable diseases such as Hodgkin's disease, leukemia, lymphosarcoma, multiple myodemia, Banti's syndrome, and others.

Although the diagnosis of hypersplenism should be suspected where there is plenomegaly, cytopenia, and hyperplastic marrow, Dr. Sturgis is in accord with the view that there is no positive way to establish the diagnosis beyond doubt before splenectomy is undertaken.

Splenectomy is considered to give almost 100 per cent successful results in hereditary spherocytosis in which the inherited defect makes the erythrocytes more easily destroyed. The author believes that ACTH or cortisone should be given a trial in chronic idiopathic thrombocytopenia purpura and in acquired hemolytic anemia before splenectomy is done.

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GERIATRICS *in the* NEWS

All announcements and news relating to geriatric medicine and research should be directed to GERIATRICS, Editorial Department, 84 South Tenth Street, Minneapolis 2, Minnesota.

New Approach to Housing of the Aged

The Chicago Housing Authority with cooperation of the committee on the aged of the Welfare Council has launched a study to discover the most beneficial pattern of housing for the aged. In most projects, attempt is being made to house older people in apartment buildings occupied by younger people. In this way, aged tenants who have become bedridden or mentally disturbed are quickly noticed by tenants and management staff, and attention is called to various community service agencies cooperating in the project.

•

Thyroid Essay Award

The American Goiter Association is offering the **Van Meter Prize Award** of $300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. Essays may cover either clinical or research investigations, and should not exceed 3,000 words. Manuscripts are to be sent to the corresponding secretary, Dr. John C. McClintock, 149½ Washington Avenue, Albany 10, New York, not later than January 15, 1954.

•

Arthritis Fellowships

The Arthritis and Rheumatism Foundation offers the following research fellowships in the basic sciences related to arthritis: (1) predoctoral ranging from $1,500 to $3,000 per year and tenable for one year with prospect of renewal; (2) postdoctoral from $3,000 to $6,000 per year and tenable for one year with prospect of renewal; and (3) senior fellowships for experienced investigation, carrying an award of $6,000 to $7,500 per

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Cancer Fellowships

Several fellowships for residency training in oncology have been announced by the New Jersey State Department of Health. The amount of each fellowship is $3,600 per year for training in general oncology or one of the special aspects of the subject. Applicants must be citizens of the United States, licensed to practice in New Jersey or eligible for licensure, and accepted by a participating institution.

•

International Gerontological Congress

The *International Gerontological Congress* will meet in London and Oxford, England, July 12-22, 1954. For further information write Professor R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England.

•

New Publications

The Governor's Commission to study problems of the aged has issued a comprehensive report on **Old Age in Rhode Island.** The report is the result of more than a year's study of economic, employment, medical, recreational, and social problems of the aged in Rhode Island. A state program for improving the welfare of the aged is outlined and specific recommendations are made.

A 76-page mimeographed document by Dr. Lawrence F. Greenleigh, entitled **Changing Psychological Concepts of Aging,** has been published by the National Institute of Mental Health, Department of Health, Education, and Welfare, Washington 25, D. C. In this report, Dr. Greenleigh describes the work of the investigators with whom he talked at various centers of psychological research on aging.

A booklet made possible by a grant from The Service Club of Milwaukee and entitled **Are You Selecting a Nursing Home?** has been published recently by the Central Agency for Chronically Ill, 756 N. Milwaukee St., Milwaukee 2. Important points to consider before placing a member of a family in a nursing home are considered. Also covered in the booklet are a check list of questions to answer about the needs of the patient, what to expect of nursing homes, and how to look for desirable qualities of care.

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New and Nonofficial Remedies: A.M.A. Council on Pharmacy and Chemistry, J. B. Lippincott, p. 243, 1953.

Marked diuretic action of theophylline

facilitates sodium excretion

Med. Times *81*:266 (Apr.) 1953.

Phenobarbital for relaxation without hypnosis

most useful for promoting daytime relaxation

J.A.M.A. *147*:1311 (Dec.) 1951.

Ascorbic acid + rutin for capillary protection

help to maintain capillary integrity

Delaware State M. J. *22*:283 (Oct.) 1950.

Semhyten®

BRINGS THE PRESSURE DOWN SLOWLY **SAFELY**

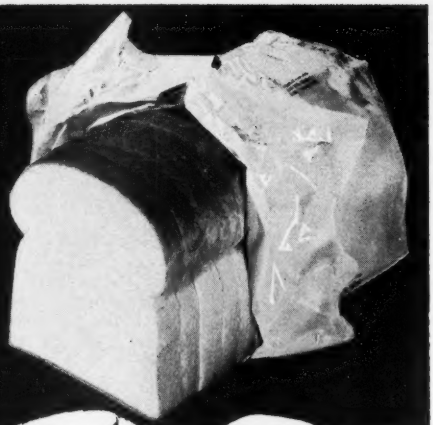
Complete Medication for the Hypertensive

Each Semhyten Capsule contains:		Phenobarbital	¼ gr. (15 mg.)
Mannitol Hexanitrate	½ gr. (30 mg.)	Rutin	10 mg.
Theophylline	1½ gr. (0.1 Gm.)	Ascorbic Acid	15 mg.

Supplied: In bottles of 100, 500 and 1000 pink-top capsules.

The S. E. MASSENGILL Company • Bristol, Tennessee

What enriched bread is doing for America today



Enriched bread, representing the bulk of bread consumed today, makes significant nutrient contributions to the dietary and to the nutritional health of the American people.[1] Bread cannot be regarded merely as an energy food. Instead, it is an important purveyor of many nutrients which a large proportion of our population would never receive in adequate amounts if enriched bread were not available on so large and wide a scale.[2] Here is what modern day enriched bread provides:

VITAMINS: Containing specified amounts of thiamine, riboflavin, and niacin, enriched bread makes a significant contribution to the satisfaction of these vitamin requirements. Enriched bread has played an important role in virtually eliminating frank deficiency diseases and materially reducing subclinical deficiency states resulting from dietary inadequacies in these essentials.[2]

MINERALS: By providing substantial amounts of calcium[3] and of added iron, modern enriched bread goes far in satisfying the needs for these substances. For example, six ounces of bread on the average provides approximately 15 per cent of the day's recommended calcium allowance for adults and 38 per cent of the iron allowance.

PROTEIN: The protein of commercial bread is of high biologic value because it is a mixture of wheat flour protein and milk protein, the latter derived from added nonfat milk solids.[4] One pound of enriched bread furnishes about 39 Gm. of protein.

ECONOMY: At its present day low price, bread represents an outstanding nutritional "buy." It provides not only generous amounts of essential nutrients, but also readily available food energy. These features truly make enriched bread one of America's *basic foods.*

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

REFERENCES

1. Sebrell, W. H., Jr.: Trends and Needs in Nutrition, J.A.M.A. *152*:42 (May 2) 1953.
2. Flour and Bread Enrichment, 1949-50: Prepared by The Committee on Cereals, Food and Nutrition Board, National Research Council, 1950.
3. Data furnished by the Laboratories of the American Institute of Baking, Chicago, Illinois.
4. Sherman, H. C.: Chemistry of Food and Nutrition, ed. 8. New York, The Macmillan Company, 1952, pp. 212; 597-600; 646.

AMERICAN BAKERS ASSOCIATION

20 NORTH WACKER DRIVE • CHICAGO 6, ILLINOIS

stimulates vaginal epithelium

Ortho®

Dienestrol Cream

vaginal estrogen therapy

for topical estrogen therapy

—in postmenopausal vaginitis

—in atrophic vaginitis

—in pruritus vulvae

—in plastic pelvic surgery—preoperatively

Dosage: one applicatorful intravaginally daily for one to two weeks; reducing gradually to once every two days for a similar period or as indicated.

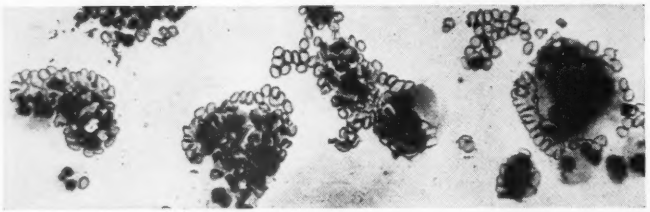
Ortho

On original prescriptions specify
"Dienestrol Cream *with applicator.*"
Also available—"*tube only*" refills.

Active Ingredient: Dienestrol—0.1 mg. per Gm. of cream.

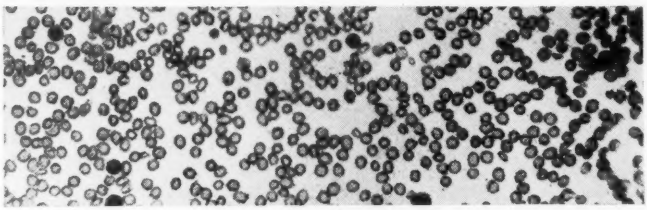
VISUAL PROOF

of the Unique Hematologic Action of Therapeutic Cobalt



Bone marrow showing—acquired erythrocytic hypoplasia—no nucleated erythrocytes.

Same patient showing—active erythropoiesis following cobalt therapy.



The photomicrographs illustrate the action of therapeutic level cobalt in producing actual regeneration of erythrocytes and their precursors even in severely *depressed human bone marrow.*

Because of extensive clinical studies with RONCOVITE—the original cobalt product—this understanding of direct stimulation of the depressed bone marrow has brought a completely new approach to the treatment of "secondary" anemia.

Roncovite provides a significant advance in the treatment of the great majority of *all* the microcytic and normocytic anemias commonly seen in practice.

In severe cases of anemia accompanying infectious and inflammatory disease, Roncovite may act so dramatically *as to make transfusion unnecessary*[2] while in prolonged "low grade anemia" it may simply overcome the erythropoietic inhibition which has prevented improvement in the blood picture.

Suggested Dosage: One tablet four times daily in adults; 0.6 cc. daily in infants.

RONCOVITE

DOSAGE FORMS

Roncovite Tablets—enteric coated, red, each contains cobalt chloride, 15 mg.; ferrous sulfate, 0.2 Gm.; bottles of 100.

Roncovite Drops—each 0.6 cc. contains cobalt chloride, 40 mg.; ferrous sulfate, 75 mg.; bottles of 15 cc. with calibrated dropper.

Write for literature and complete bibliography.

LLOYD BROTHERS, INC. **CINCINNATI 3, OHIO**

In the Interest of Medicine Since 1870

1. Case 2, Seaman, A. J., and Koler, R.: Acta Hematologica, 9:153, 1953.
2. Gardner, Frank H., J. Lab. Clin. Med.; 41:56, 1953.

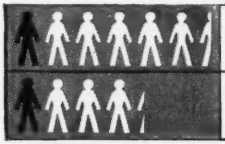
the realization of a hope . . .

a new physio-chemical complex

normalizing cholesterol metabolism

MONICHOL*

I.V.C®



One out of every 6.3 cardiovascular patients

One out of every 4.1 diabetic patients has hypercholesteremia.†

Recent studies have proved that Monichol*, generally normalizes elevated blood cholesterol levels. Patients treated showed a *significant* drop of serum cholesterol levels ranging from 59 to 233 mg. per 100 ml.†

Monichol, therefore, is indicated both prophylactically and therapeutically in patients showing elevated serum cholesterol levels associated with cardiovascular disease and diabetes.

Monichol has cholesterol lowering properties not attributable to any of its component parts.

Monichol, in the experience of the investigators, has proven to be entirely non-toxic.

Monichol normalizes cholesterol metabolism

Formula: Each teaspoonful (5 cc.) of Monichol contains:

Polysorbate 80	500 mg.
Choline Dihydrogen Citrate	500 mg.
Inositol	250 mg.

Dosage: 1 tsp. (5 cc.) 4 times daily or 2 tsps. twice daily after meals.

Supplied: In bottles of 12 oz. Literature available on request.

IVES-CAMERON COMPANY, INC., 22 East 40th Street, New York 16, N. Y.

†Sherber, D. A., and Levites, M. M.: Hypercholesteremia. Effect on Cholesterol Metabolism of a Polysorbate 80-Choline-Inositol Complex (MONICHOL) J.A.M.A. 152:682 (June 20) 1953. *Trademark

Over a Quarter Century of Service to the Medical Profession

Doctors . . .

For recommendation to your patients over 60, the Cold Spring Project is a pilot experiment in residential adult education for college graduates, men and women of good physical and mental health. For a period of six or nine months, the residents engage in an active program in the creative arts—painting, ceramics, writing; such crafts as woodworking, photography; and a program of lectures and discussions led by men and women prominent in their special fields of the humanities, the sciences and social problems. The entire program is organized around the individual needs of the registrants who are urged but not required to participate in a wide variety of activities. Medical, psychiatric and psychological consultation and counselling available to registrants as desired.

For information brochure, write:

RUTH ANDRUS, Ph. D., *Director*
The Cold Spring Project
COLD SPRING-ON-HUDSON 4,
PUTNAM COUNTY, NEW YORK

reinforced action
in common infections

Erythrosulfa*

antibiotic action of erythromycin
chemotherapeutic
effect of triple sulfonamides

valuable especially in staphylococcal, streptococcal, and pneumococcal infections

Each tablet contains
Erythromycin . . . 100 mg.
Sulfadiazine . . . 0.083 Gm.
Sulfamerazine . . 0.083 Gm.
Sulfamethazine . 0.083 Gm.

Upjohn

*TRADEMARK

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

GOOD FOR GRANDMA, TOO!

Borcherdt

MALT SOUP
*Extract**

A New Dietary Management for

CONSTIPATED ELDERLY

Developed originally for infant constipation, Malt Soup Extract provides a new means of treating constipation in the elderly. Gentle, safe, physiologic action. No harsh laxative drugs, no mineral oil, no bulk laxatives. Meets a real need in geriatrics!

DOSE: 1 or 2 tablespoonfuls QID until stools are soft (may take several days), then 1 or 2 Tbs. at bedtime.

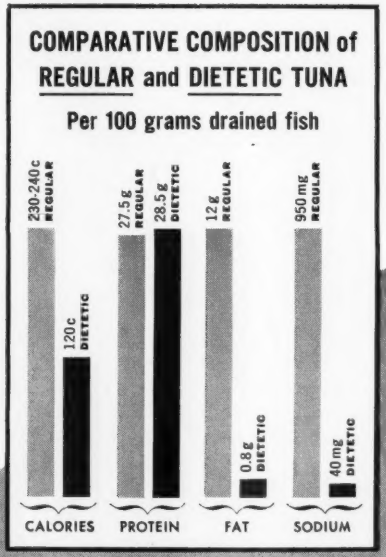
*Specially processed malt extract neutralized with potassium carbonate.

BORCHERDT MALT EXTRACT CO.
217 N. Wolcott Ave., Chicago 12, Ill.

DIETETIC TUNA IN THE TREATMENT OF

Obesity

In obesity, Dietetic Tuna meets the need for a low-fat, low-sodium, high-protein food. Dietetic Tuna answers the oft-repeated question, "But, doctor, what can I eat?" No longer must canned fish be taboo for the obese patient. Containing essential and nonessential amino acids in well proportioned ratio, Dietetic Tuna obviates the most frequent nutritional deficiencies encountered in prolonged low-caloric diets.



both brands the same high quality

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MAIL COUPON FOR SAMPLES

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Van Camp Laboratories • Terminal Island, California

Please send samples and complete information on DIETETIC TUNA.

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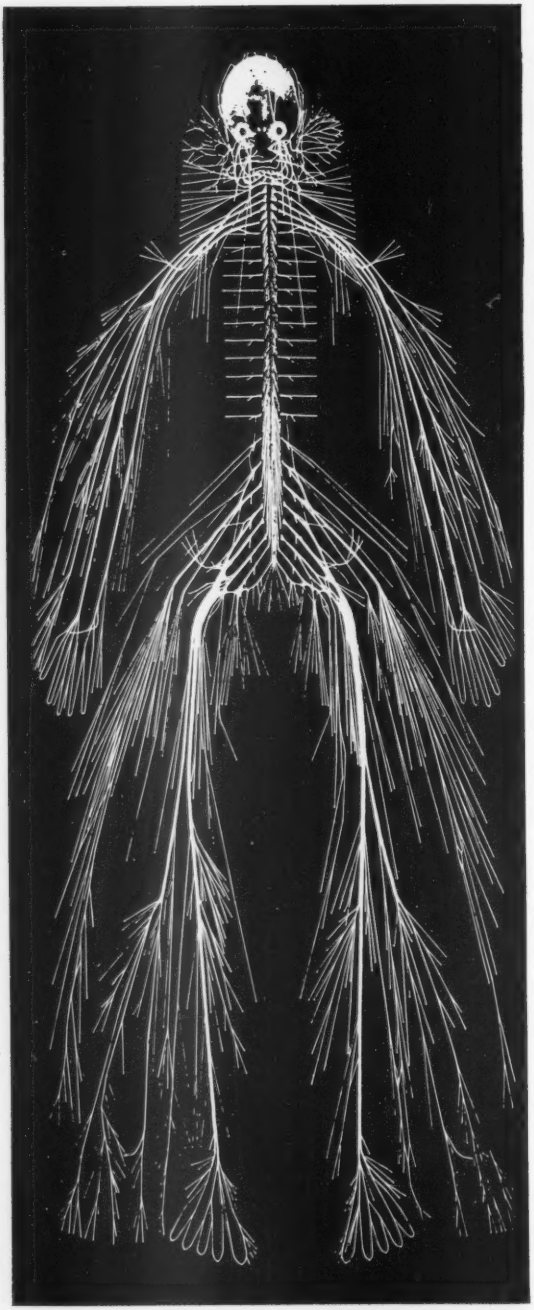

To **UNTANGLE**
that
bundle
of nerves

BĒPLETE—for its tranquilizing effect on your tense, overemotional, anorectic patient. The BĒPLETE formula is a judicious combination of low dosage sedation and high dosage of vitamin B factors, including therapeutic quantities of vitamin B_{12}.

Bēplete®

Vitamins B Complex with Phenobarbital

. . . highly palatable Elixir, and Tablets. Also available, BĒPLETE with BELLADONNA for combined antispasmodic-sedative action; Elixir or Capsule form.

Wyeth®
Philadelphia 2, Pa.

← Dissection of nervous system by R. P. Weaver, A.M., M.D., Sc.D., late Professor of Anatomy, Hahnemnan Medical College and Hospital. Courtesy of Hahnemann Medical College Museum.

In Many Respects

THE SAFEST AMONG THE MORE POTENT HYPOTENSIVES

- **lowers blood pressure by centrally induced vasorelaxation**
- **hypotensive action independent of alterations in heart rate**
- **retains its efficacy during prolonged periods**
- **rarely promotes sensitivity or increased tolerance**
- **produces warning symptoms of overdosage before the critical level has been reached**
- **no paralysis of sympathetic activity**
- **no postural hypotension**
- **no compromise of renal function**
- **no reduction in cardiac output or cerebral blood flow**
- **no tachycardia or increase in cardiac work**

These are the desirable pharmacologic and clinical features of Veriloid which establish this alkaloidal extract of Veratrum viride as the safest of the potent hypotensives. Note that your patient need not be hospitalized, can maintain his normal business and social activities, and is not living in constant danger of hypotensive collapse due to sudden changes in posture. No death attributable to Veriloid has ever been reported, yet this drug has enjoyed extensive use during the past five years. Average initial dose, 3 to 4 mg. three times daily after meals, at intervals of not less than four hours.

An Original Research Product of

RIKER LABORATORIES, INC.

8480 BEVERLY BLVD., LOS ANGELES 48, CALIF.

VERILOID®

reinforced action
in common infections

Erythrosulfa*

antibiotic action of erythromycin
chemotherapeutic
effect of triple sulfonamides

valuable especially in staphylococcal, streptococcal, and pneumococcal infections

Each tablet contains
Erythromycin . . . 100 mg.
Sulfadiazine . . . 0.083 Gm.
Sulfamerazine . . 0.083 Gm.
Sulfamethazine . 0.083 Gm.

*TRADEMARK

Upjohn

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

for ulcer patients
allergic to milk

MULL-SOY®

the hypoallergenic soy food with prompt, sustained acid-buffering action

For samples, write

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THERAPEUTICALLY EFFECTIVE

IODEX cum methyl salicylate

indicated wherever the stimulating and metabolic effects of IODINE in *IODEX* and the analgesic action of Methyl Salicylate are needed topically and for percutaneous absorption.

For strains, sprains, painful joints and aching muscles • rheumatic pains • relieves itching in skin diseases.

Samples and literature sent on request.

MENLEY & JAMES, LTD.,
70 WEST FORTIETH STREET, NEW YORK 18, N. Y.

following anorectal surgery . . .

". . . more rapid postoperative healing as compared with patients on mineral oil"[1]

Cantor[1] concludes—after studying 400 patients, equally apportioned between mineral oil and refined psyllium therapy—that L.A. Formula accelerates healing as much as 2 to 4 weeks compared with patients taking mineral oil for the management of postoperative constipation following anorectal surgery. This is due, he states, to the clean wound area which L.A. Formula leaves for the better development of granulation tissue.

Cantor notes these additional advantages of L.A. Formula therapy. L.A. Formula provides an internal dilator action which acts to prevent adhesions, stricture and stenosis. Patients find L.A. Formula palatable and easy to take and do not become habituated to its use. Its laxative action is dependable.

He concludes that L.A. Formula "provides a natural, unabsorbable bulk and lubricant with no clinical disadvantages. It offers many advantages over mineral oil and has none of mineral oil's disadvantages." *Burton, Parsons & Company, Washington 9, D. C.*

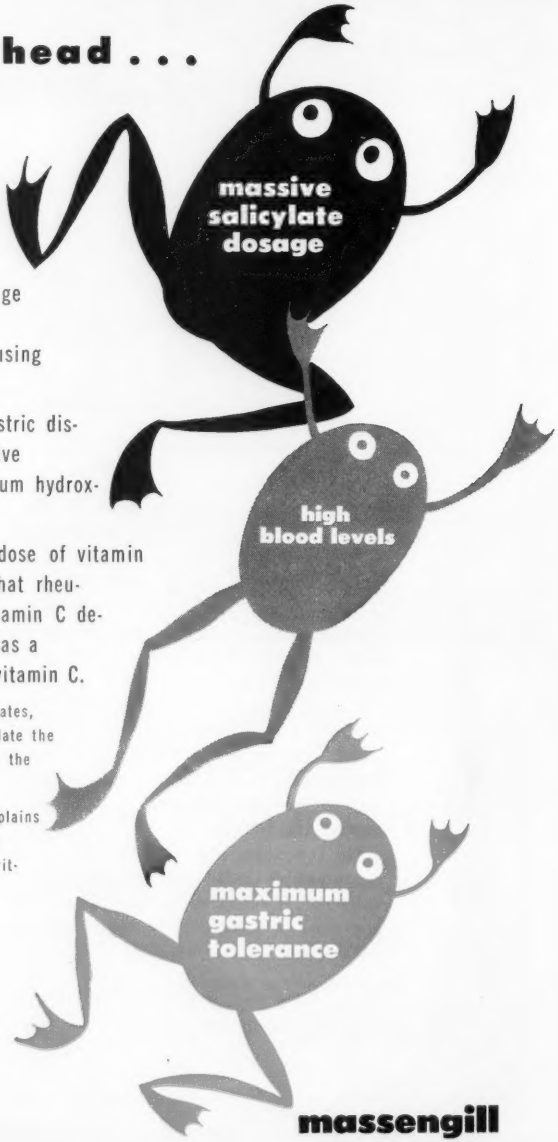
Send for Samples for Clinical Appraisal

1. Cantor, A. J., Am. J. Proctol. 3:204-210, (Sept.) 1952.

L. A. FORMULA

effective bulk producer • unsurpassed for palatability

IN ARTHRITIS
three jumps ahead . . .



MASSIVE DOSAGE

To obtain maximum results, high salicylate blood levels are required. This means high oral dosage which can be attained, without excessive gastric disturbance, by using Salcedrox.

Salcedrox virtually eliminates gastric disturbance, because of the protective combination with activated aluminum hydroxide and calcium carbonate.

Salcedrox also contains a high dose of vitamin C, because it has been observed that rheumatic and arthritic states show vitamin C deficiencies, and salicylate therapy has a tendency to intensify depletion of vitamin C.

There is significant evidence that salicylates, through action on the hypothalamus, stimulate the pituitary, producing an ACTH- like effect on the adrenal cortex. *

This new concept of salicylate action explains many of the clinical results obtained with salicylate therapy in the treatment of arthritides and rheumatic afflictions—observed results that cannot be attributed to analgesic action alone.

*Proceedings Soc. Exp. Bio. Med., 1952, v80, 51-55, G. Cronheim, et al.

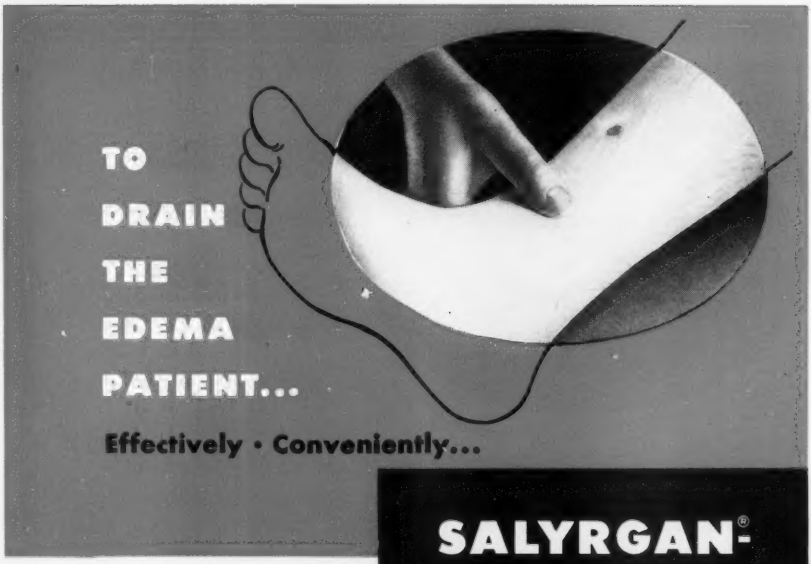
FORMULA

Sodium Salicylate....5 gr. (0.3 Gm.)
Aluminum Hydroxide Gel. dried.....2 gr. (0.12 Gm.)
Calcium Ascorbate.....1 gr. (60 mg.) (equivalent to 50 mg. Ascorbic Acid)
Calcium Carbonate....1 gr. (60 mg.)

massengill
BRISTOL, TENN.

send for professional literature

SALCEDROX



SALYRGAN®-Theophylline

MERCURIAL-XANTHINE DIURETIC

Solution • Tablets

FOR EDEMA
due to
cardiovascular
and renal
insufficiency,
as well as
hepatic
cirrhosis

By a dual action on the kidneys which both increases the volume of the glomerular filtrate and diminishes tubular resorption, Salyrgan-Theophylline rapidly produces copious diuresis.

The response to Salyrgan-Theophylline solution does not "wear out" so that doses may usually be repeated as required, without loss of efficiency.

With Salyrgan-Theophylline tablets taken orally, patients appreciate the gradual, non-flooding diuresis and the greater convenience. Salyrgan-Theophylline tablets "can successfully decrease the patient's burden... either by decreasing the need for frequent mercurial injections or by actually replacing the injections entirely."[1]

WINTHROP

1. Abramson, Julius, Bresnick, Elliott, and Sapienza, P. L.: *New England Jour. Med.*, 243:44, July 13, 1950.

Winthrop-Stearns INC.

NEW YORK 18, N.Y. WINDSOR, ONT.

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

"MEDIATRIC"® CAPSULES

IN PREVENTIVE GERIATRICS

A dynamic approach to better health for the aging patient

"Mediatric" Capsules are specially formulated to meet the needs of your aging patients – the post-menopausal woman and the man over 50. Steroids and nutritional factors will effectively counteract declining sex hormone function and dietary inadequacy, as well as interact to maintain the integrity of general metabolic processes. The mild anti-depressant will tend to promote a brighter mental outlook. "Mediatric" Capsules will help your patients enjoy better health now and in the years to come.

Each capsule contains:

STEROIDS	
Conjugated estrogens equine ("Premarin"®)	0.25 mg.
Methyltestosterone	2.5 mg.
NUTRITIONAL SUPPLEMENTS	
Vitamin C (ascorbic acid)	50.0 mg.
Thiamine HCl (B_1)	5.0 mg.
Vitamin B_{12} U.S.P. (crystalline)	1.5 mcg.
Folic acid	0.33 mg.
Ferrous sulfate exsic.	60.0 mg.
Brewers' yeast (specially processed)	200.0 mg.
ANTIDEPRESSANT	
d-Desoxyephedrine HCl	1.0 mg.

No. 252 — Supplied in bottles of 30, 100, and 1,000.

SUGGESTED DOSAGE:

Male: One capsule daily, or more as required.

Female: One capsule daily, or more, taken in 21-day courses with a rest period of one week between courses.

5328

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